VOLUME LVI NUMBER THREE

THE NATIONAL GEOGRAPHIC MAGAZINE

SEPTEMBER, 1929

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ORGANIZED FOR "THE INCREASE AND DIFFUSION OF GEOGRAPHIC KNOWLEDGE"

TO carry out the purposes for which it was founded forty-one years ago the National Geographic Society publishes this Magazine monthly. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole, and has contributed $25,000 to Commander Byrd's Antarctic Expedition.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society has conducted extensive excavations at Pueblo Bonito, New Mexico, where prehistoric peoples lived in vast communal dwellings before the days of Columbus; it is sponsoring an ornithological survey of Venezuela, and is maintaining an important photographic and botanical expedition in Yunnan Province, China.

TO further the study of solar radiation in relation to long range weather forecastings, The Society has appropriated $65,000 to enable the Smithsonian Institution to establish a station for five years on Mt. Brukkaros, in Southwest Africa.

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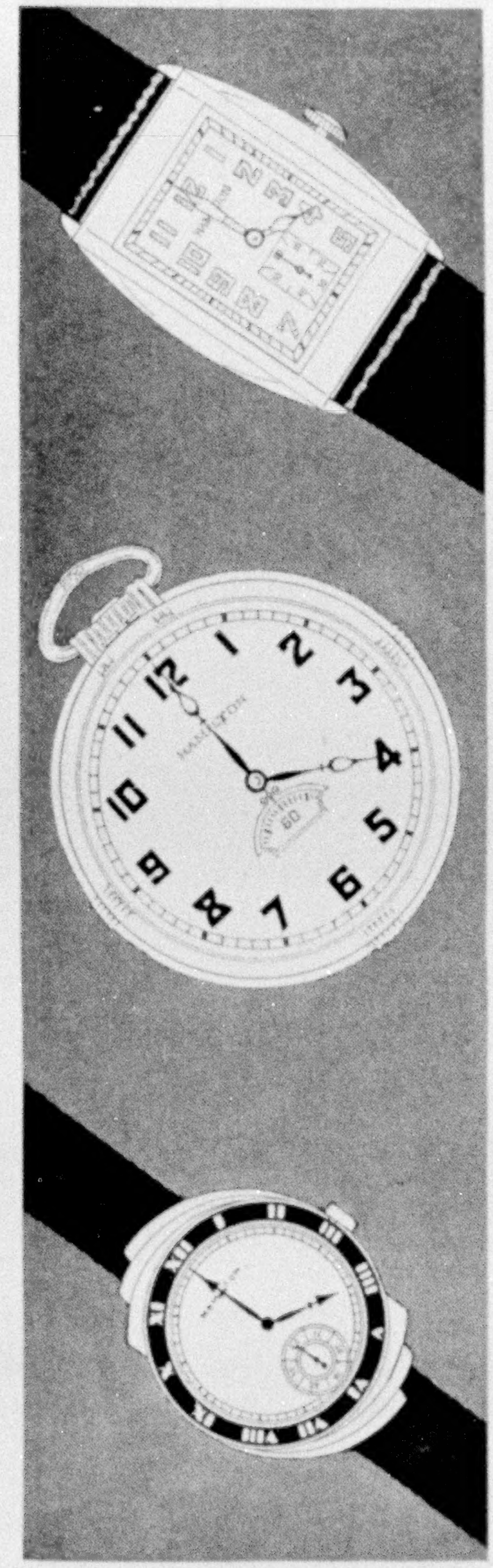
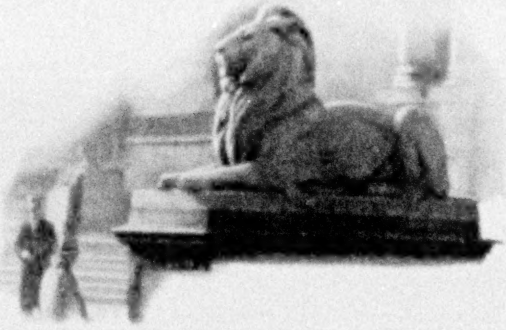
The meeting was called for 4 o'clock



NEW HAMILTON MODELS

Above—*The "Gladstone"—a brand-new strap in plain case and available only in 14k filled green or white gold, $55. Other Hamilton strap watches from $50 upward.* Center—*The "Farragut"—with a modish new secometer dial—in 14k filled white or yellow gold,* $55. Below—*The "Spur"—in solid 14k yellow or white gold with 19 jewels, $125.*



At one minute before the hour the trustees were in their chairs

IT WAS the monthly meeting of the trustees of the New York Public Library. At one minute before the appointed hour the attendant closed the doors. As he did so he took notice that all the chairs were occupied.

The spacious room and its furnishings reflected the dignity of the building. A long table centered the setting.

Here sat a steel king. At his right a Prince of the Church. Next an ex-Secretary of State. Three lawyers of international fame. Two former Justices of the Supreme Court. And a group of financiers whose names make Wall Street pause.

The meeting had been called for 4 o'clock. At 4 o'clock the meeting began. Every man was on time.

* * * *

Can you tell a successful man by the Time he carries?

"Yes," says Dudley Nichols of the New York *World*. "Of 75 bank officials that I interviewed in New York City, 69 were within a scant half minute of exact time. Apparently a man bears something around with him, ticking away in his pocket, that blabs the truth about his success!"

If you'll look at the watches of these time-minded men, you'll find many of them are Hamiltons. For there are no "ifs" about Hamilton accuracy. The two words belong together. "Hamilton" *means* "Accuracy," whether you want a pocket or a strap model, from $48 to $685. Send for our interesting booklet, "The Timekeeper," Hamilton Watch Co., 882 Columbia Ave., Lancaster, Penna., U. S. A., American manufacturers of high-grade watches.

Hamilton

The Watch of Railroad Accuracy

CADILLAC
LASALLE
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An inspiring spectacle of satisfaction

THE contrary may have happened in some instances, but we have never heard of a case in which a Cadillac owner was induced to change in which disappointment did not ensue. The really significant thing however—in view of the tremendous pressure brought to bear upon them—is the amazingly small percentage of those who *do* change even in a five or ten year period. Cadillac owners are, of course, as they have always been, the focal-point of continuous competitive attack from a dozen aspiring and ambitious sources. But the solid phalanx of deep, abiding and immovable satisfaction remains substantially unbroken. The downright greater goodness of Cadillac in everything that makes a motor car a thing of beauty and a joy forever is too pronounced to be lightly forfeited.

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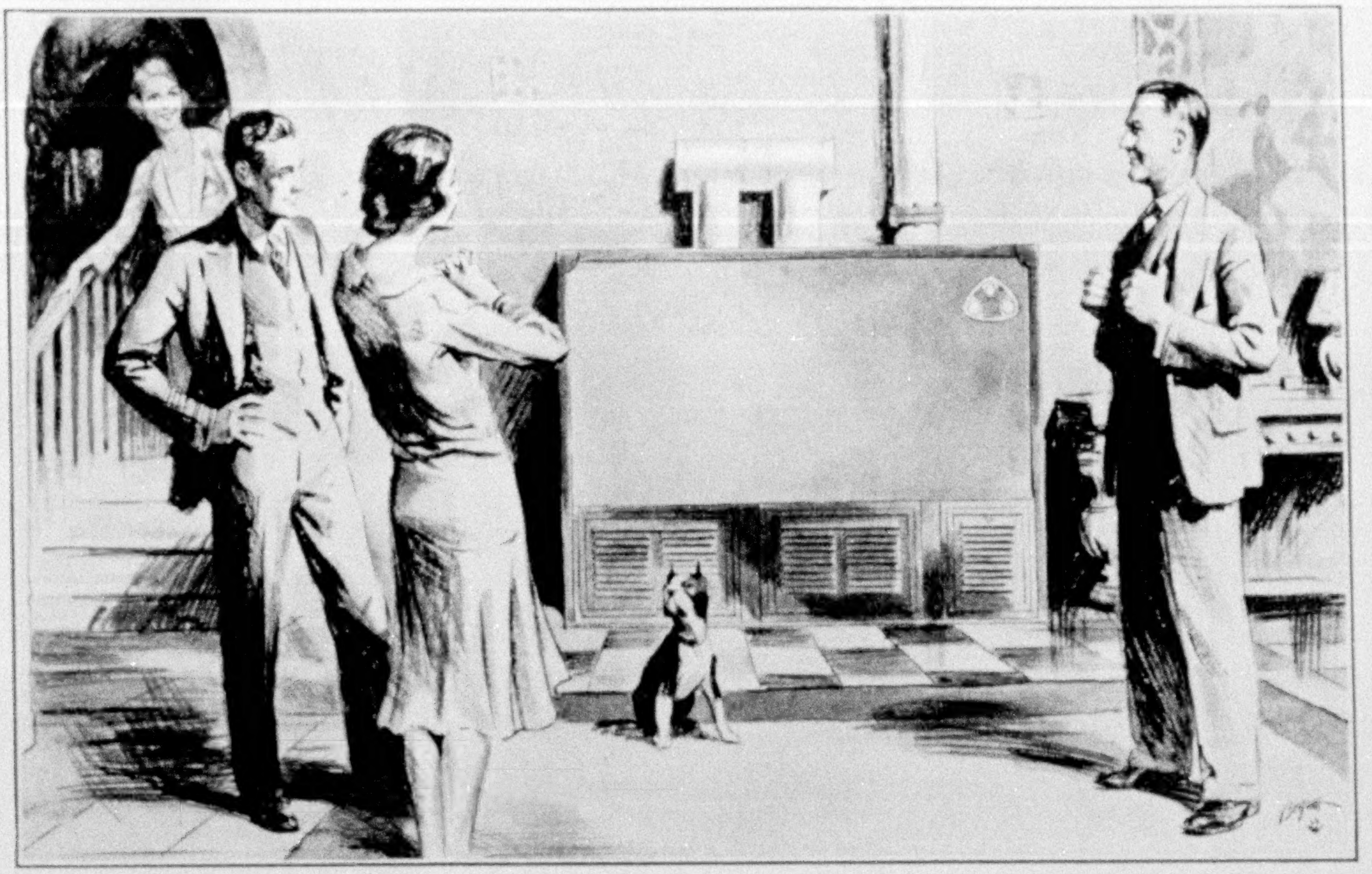
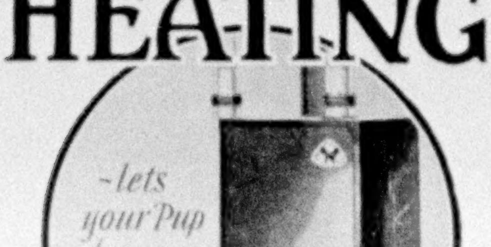


"Now we can let the pup be Furnace Man"

When the Bryant Pup takes charge, your furnace room can be just as you see it above. No shovels, brooms or refuse cans hidden "around the corner." No dirt-distributing fuel bin or storage tank somewhere outside of the picture for the pup or his household to bother about. A Bryant Boiler or Furnace is as clean in the basement as it is in the picture. The pup remains a happy, carefree canine who sleeps quietly in a noiseless furnace room.

BRYANT GAS HEATING


-lets your Pup be your Furnace Man

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Real estate men can testify that for many years the one-bathroom house has been a drug on the market and that the house with a one-car garage is entering the same category. In another year or two the house with hand-fired heating is doomed to join them in unpopularity.

By all means install an automatic heating plant but, before buying, get the answer to five questions. How long has it been on the market? How many installations have been in use five years or more? What is their average annual cost for service and repairs? What is the financial standing of the maker? Who, if anyone, will stand behind it in the event that its local representative goes out of business?

Let us send you a complete description of Bryant Automatic Gas Heating—the truly automatic method that, by twenty years of service under all residential conditions, has proved its right to the slogan—

"You can let your Pup be Furnace Man!"

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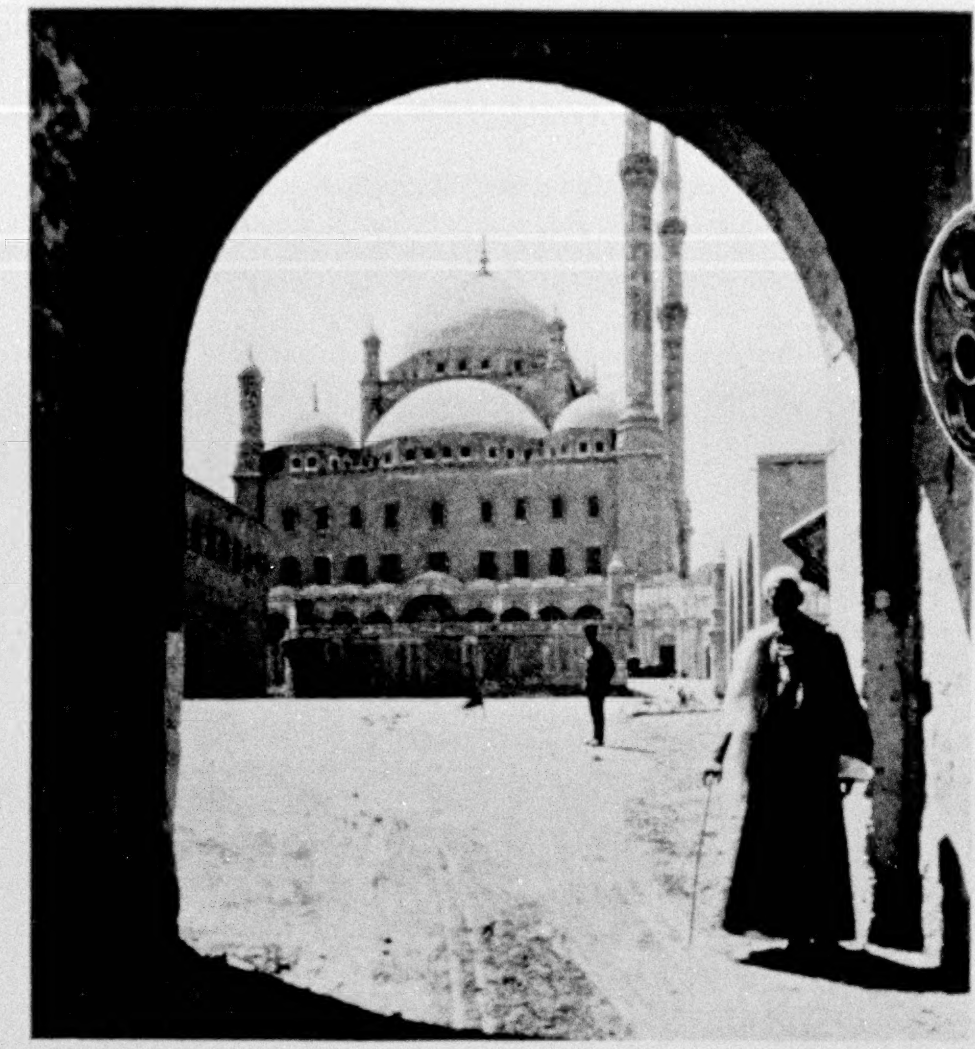
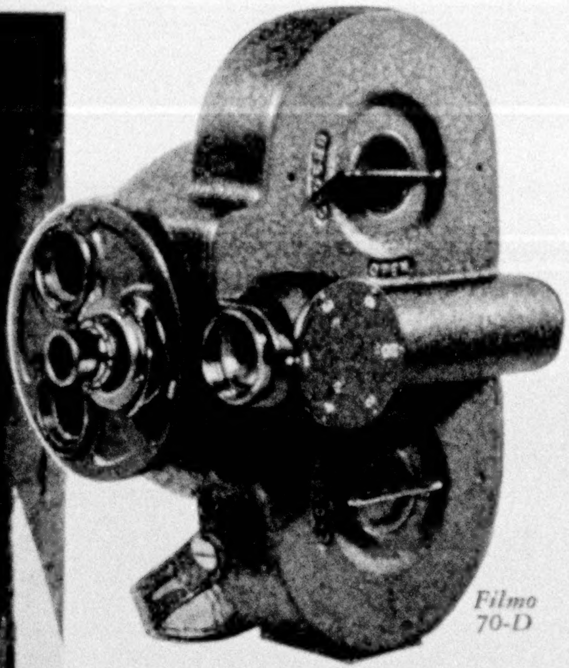
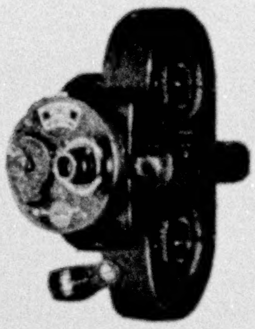
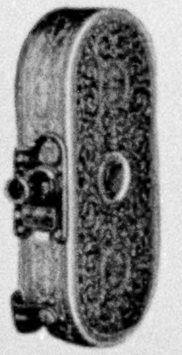




Filmo 70-D



Filmo 70-A, the original personal movie camera, $180 and up, with carrying case.



Filmo 75, pocket size and aristocratic, $120 and up, with carrying case.

Relive your travels ...with FILMO

Scene after scene sweeps by the world traveler, in flashing panorama. There is little enough time to become intimate with the quaint and fascinating details of each place of interest. Yet, with a Filmo along, no detail need be lost, and there is time indeed for loitering, when you take the trip over again... in moving pictures... at home.

And now a movie record such as was never possible before can be yours with Filmo 70-D, the new seven-speed turret-head camera. Three lenses are ready, at a twist of the wrist, to catch far-away scenes, close-ups, and those shots which light conditions ordinarily make difficult. An ingenious variable spy-glass viewfinder shows you the exact view being taken. And the turn of a dial gives you from the fastest to the s-l-o-w-e-s-t of movies. All you do is look through the viewfinder, press the button, and "what you see, you get."

Filmo 70-D comes complete with one Taylor-Hobson Cooke 1" F 3.5 lens and a fine Mayfair carrying case equipped with SESAMEE lock, at only $245. Eight other models with various lens combinations range upward in price. Ask your dealer to demonstrate Filmo 70-A, Filmo 75 and the new Filmo 70-D, or write for literature and the illustrated booklet: "What you see, you get."

All Filmos take either a 50 or 100 foot roll of film

For black and white pictures, Filmo Cameras use Eastman Safety Film (16 mm.) in the yellow box—both regular and panchromatic—obtainable at practically all dealers' handling cameras and supplies. Filmo Cameras and Filmo Projectors are adaptable, under license from Eastman Kodak Company, for use of Eastman Kodacolor film for home movies in full color. Cost of film covers developing and return postpaid, within the country where processed, ready to show at home or anywhere with Filmo Projector.

BELL & HOWELL
Filmo

WHAT YOU SEE, YOU GET

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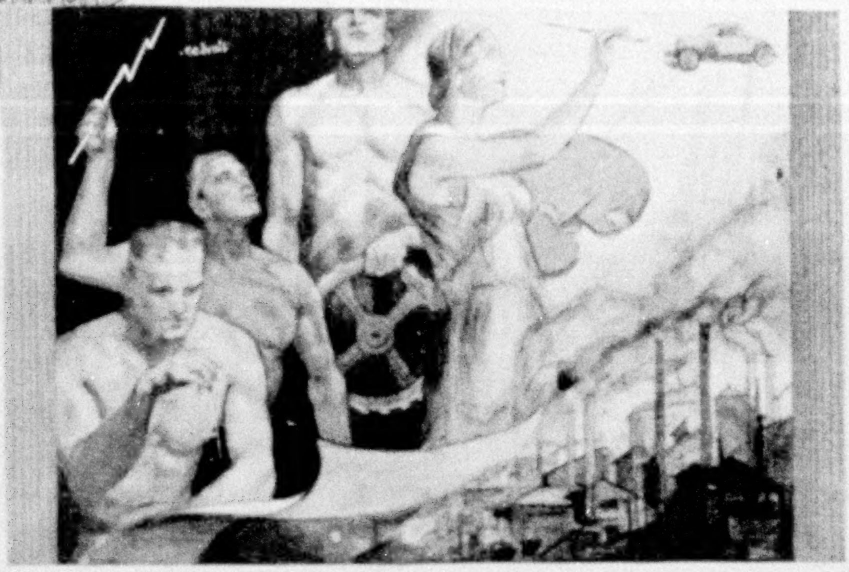

THE WORLD KNOWS THAT "BUILT BY BUICK" MEANS BUILT SUPERLATIVELY WELL

Motorists everywhere know that the new Buick, recently introduced, marks a strong advance over all previous standards in the Buick field, and are welcoming it with an enthusiasm never before manifested for any fine car.

It has often been said that Buick . . . and the great army of men and women who purchase Buick motor cars . . . are not merely buyer and seller, but *friends*.

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Millions have visited Buick showrooms in all parts of America during the past few days. Others are steadily coming to see the new Buick. Scores of thousands have requested or already taken demonstrations. And everywhere the story is the same—

Not only the warmest welcome ever accorded any quality car . . . not only the kindliest expressions of praise for Buick improvements and advancements . . . but a great outpouring of orders, more than double the record of any other automobile priced above $1200.

Men and women pay glowing tribute to the beauty of line, finish and appointment of Buick's new Bodies by Fisher. They revel in the comfort and luxury of its spacious interiors. And they know positively that only Buick can satisfy them when they experience its swifter, smoother, more powerful performance, and consider its new low prices.

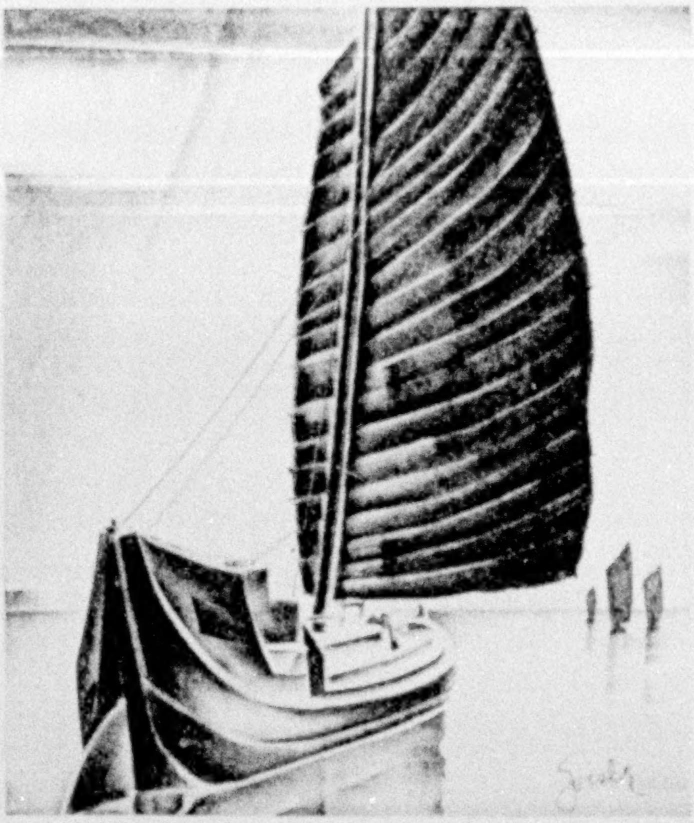
They have pronounced this new Buick the greatest Buick of them all—and are awarding it what promises to be a record demand.

The builders of Buick and Marquette gladly acknowledge a debt of gratitude, and pledge continued precision in the manufacture of both Buick and Marquette cars, that motorists may always know that "Built by Buick" means built superlatively well.

BUICK MOTOR COMPANY, FLINT, MICH.
Division of General Motors Corporation
Canadian Factories: McLaughlin-Buick, Oshawa, Ont.

BUILDERS OF BUICK AND MARQUETTE MOTOR CARS

WHEN BETTER AUTOMOBILES ARE BUILT . . . BUICK WILL BUILD THEM



133 days
46 days
11 days

which trip will YOU take?

133 days . . . **around the world on the BELGENLAND,** *largest, finest liner that has ever circled the globe. From New York December 20. A combination of masterfully arranged itinerary and ideal cruise ship that has won an unprecedented following among world travelers. Unusual side trips, including a 12-day cruise in the East Indian Archipelago and a tour of the primitive Island of Bali. Arrival in Europe in April, timely for Spring sojourns. Operated jointly by* ***Red Star Line*** *and* ***American Express Co.*** *$1750 up, including complete shore program.*

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11-day **Cruises to Havana, Nassau and Bermuda.** *Here is something new. Cruises short enough for the busiest person, yet comprehensive, including three smart winter rendez-vous. The regular fortnightly sailings enable you to stop over at your pleasure and resume your trip on a later sailing. The great* ***Red Star*** *liner LAPLAND sails Dec. 28; Jan. 11; Jan. 25; Feb. 8; Feb. 22; Mar. 8.*

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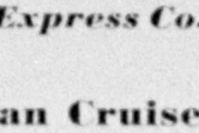

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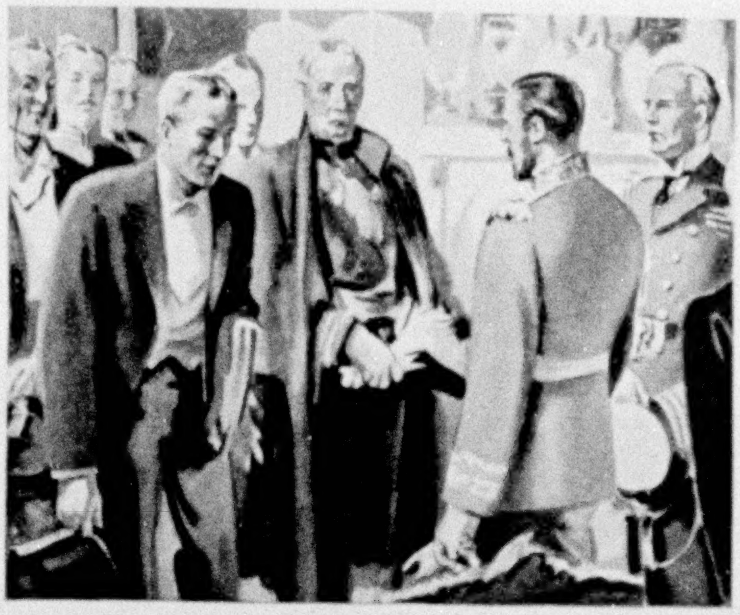
PACKARD



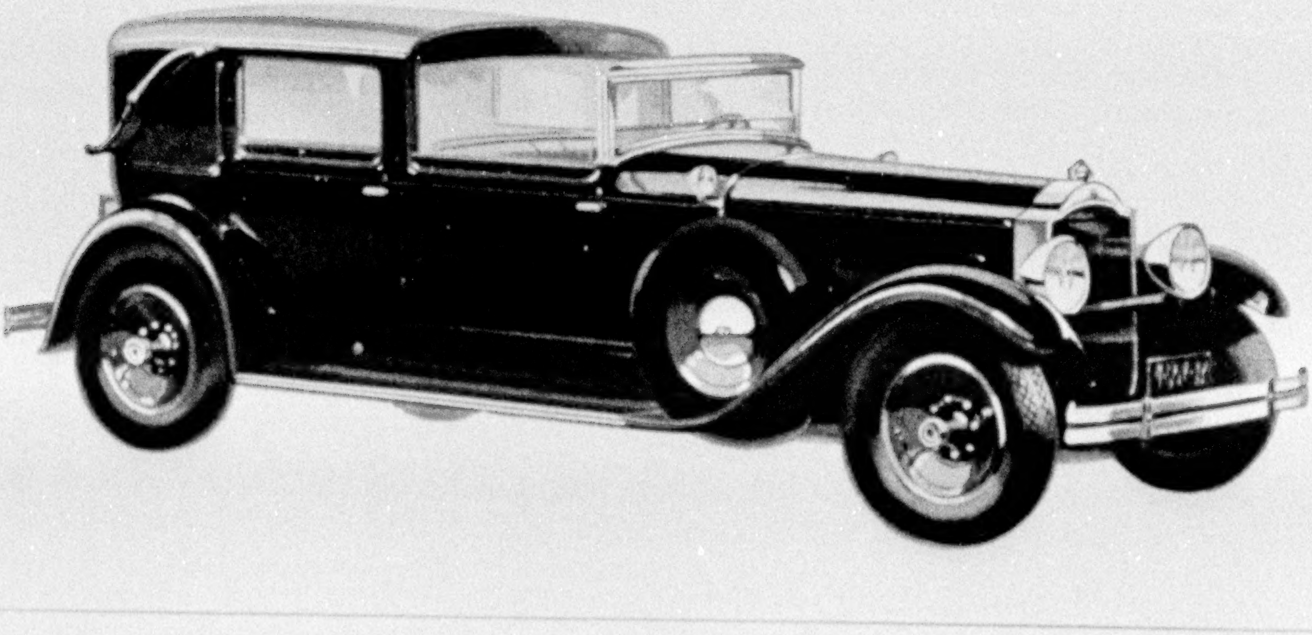
Only men of cultured background, sterling character and ripe experience merit ambassadorships from our nation to the world powers

Packard dealers are ambassadors of good will to the court of public opinion. They are chosen with utmost care by the Packard management. Character and courtesy, responsibility and integrity are among the first requirements.

And so Packard service—sales service to new customers and maintenance service to owners—is of high and dependable quality. Uniform, too, for Packard has developed a standardized practice for the guidance of dealers which insures a high character of service operations throughout the entire Union, and at fair and established rates.

Packard dealers subscribe wholeheartedly to the factory policy of "principle before profit." They interpret that policy in just and honorable dealings with their customers—in new car, in used car, and in service transactions *equally*. This Packard owners everywhere know and appreciate.

ASK THE MAN WHO OWNS ONE



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. . . AT COLLEGE
FOR THE PUPIL
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With real enthusiasm, pupils and students at home and in college, write their lessons on this sturdy little machine, developing life-long habits of accuracy and thoroughness.

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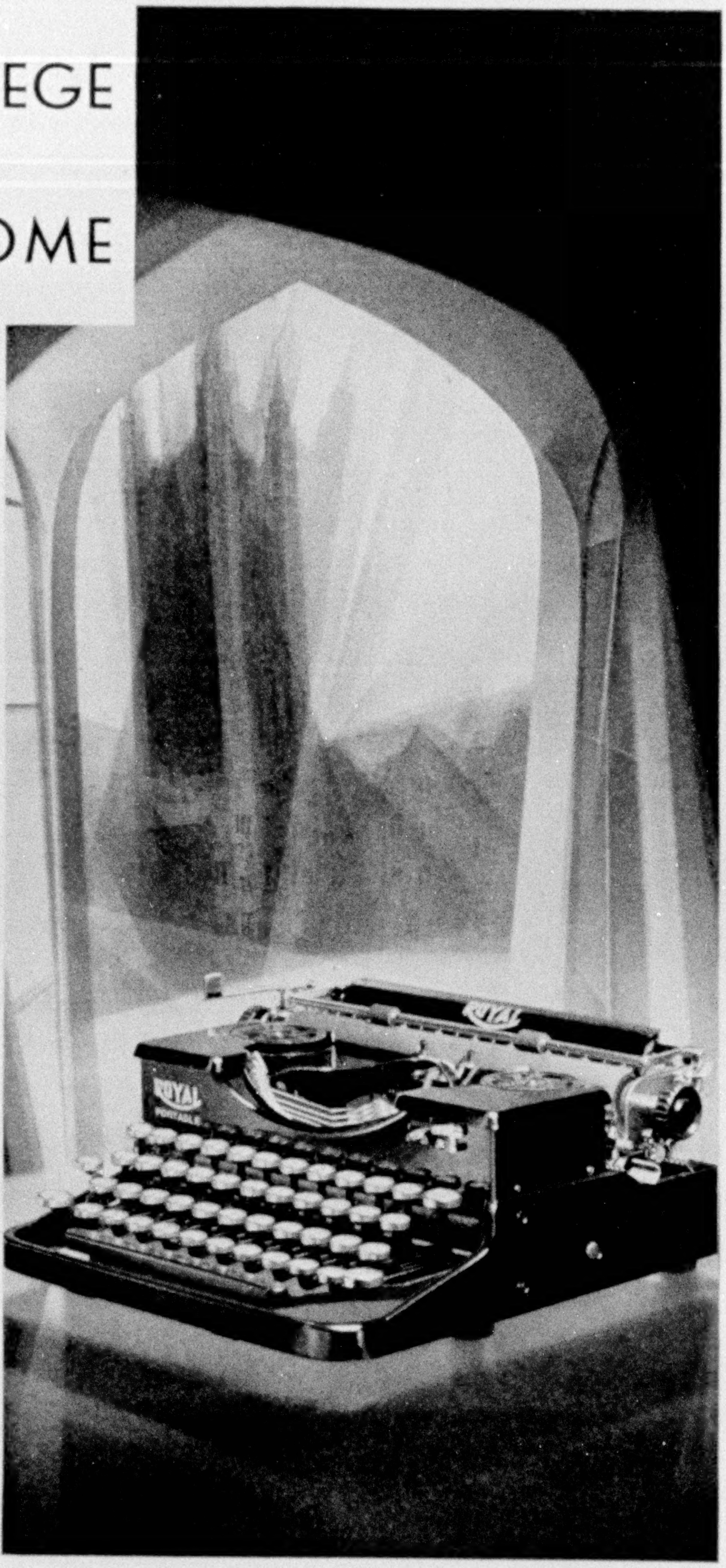

ROYAL TYPEWRITERS
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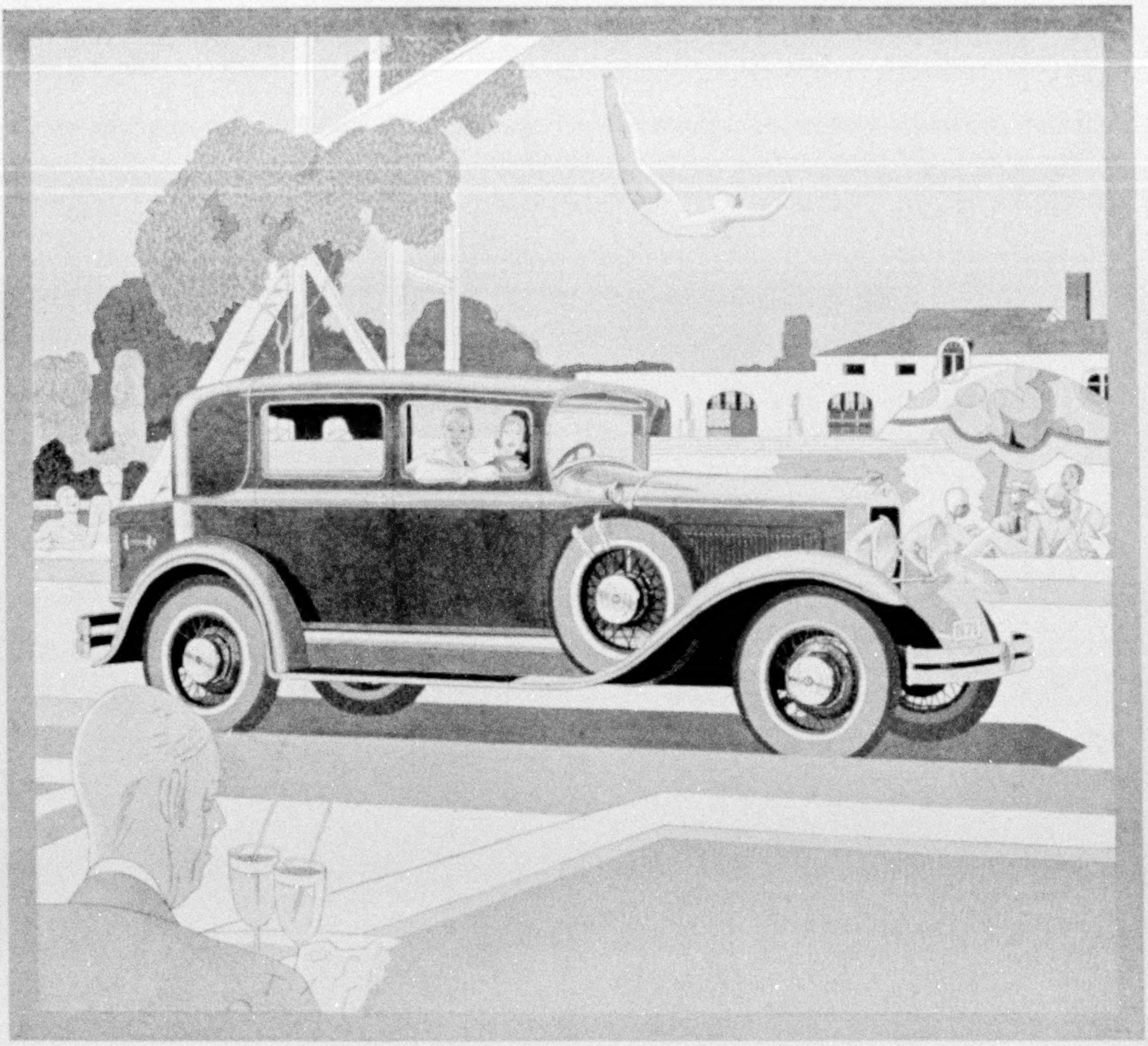

The Commander Eight Brougham for five, $1675. The Commander Six Brougham for five, $1525. Six wire wheels and trunk standard equipment. Prices at the factory. Bumpers and spare tires extra.

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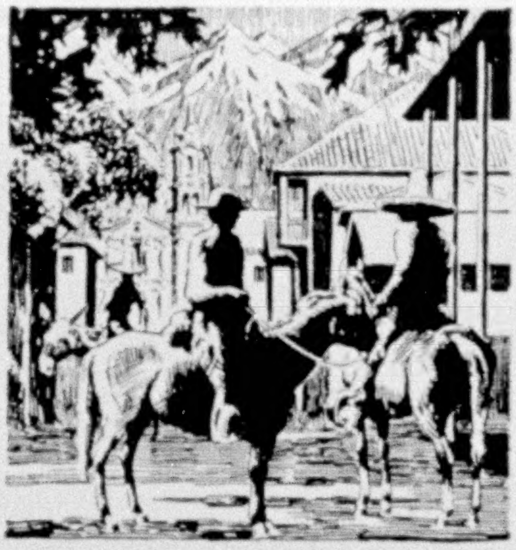
The only South America Cruise that visits all South America — West Coast, East Coast and the Straits of Magellan



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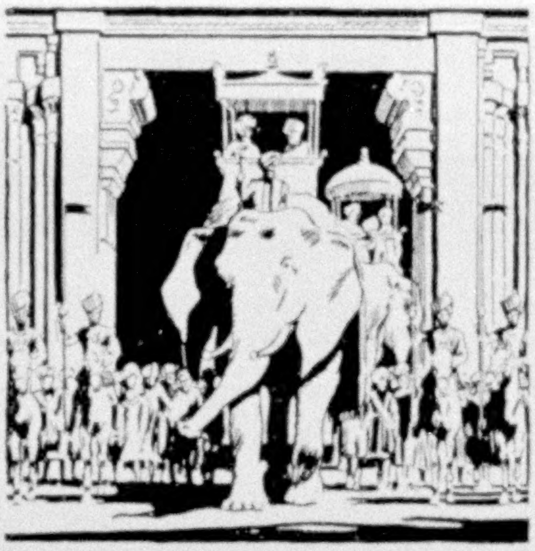

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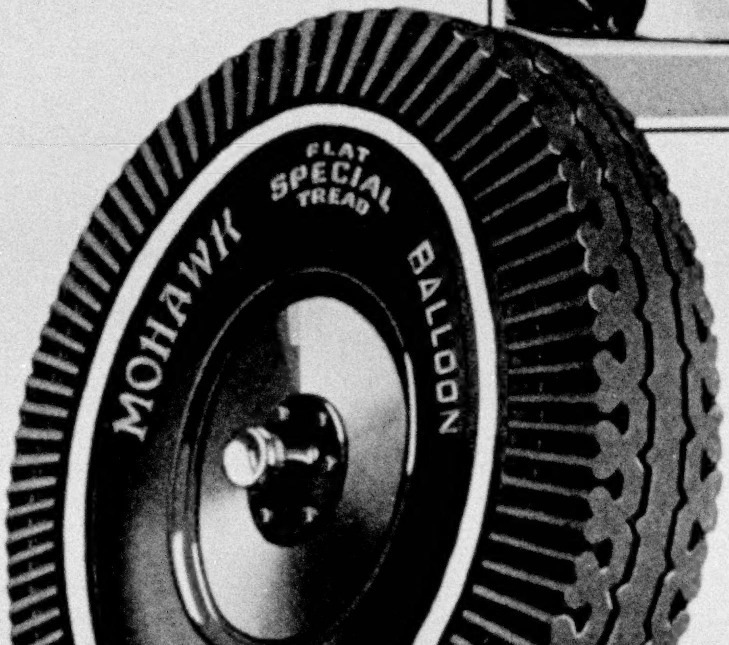

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IN cradle-like riding-comfort and effortless steering ease the Mohawk Flat Tread Special Balloon is a revelation. These coveted advantages come from two exclusive Mohawk features:

1. 15% LESS AIR PRESSURE is required because of the unique buttressed tread construction—giving immensely greater cushioning capacity.
2. THE HIGH-SHOULDERED, FLAT CONTOUR TREAD fits the road perfectly *without distortion* under any weight, and at all air pressures and speeds.

Look for the buttressed shoulders and the harmonious encircling stripe of gleaming gold, the distinguishing mark of a distinguished tire.

MOHAWKS

GO Farther!

THE MOHAWK RUBBER COMPANY . . . AKRON, OHIO

For Sixteen Years Makers of Fine Tires

ATWATER KENT RADIO

SCREEN-GRID

Your radio and your home

—now they just suit each other!

THE DAY of limited choice in cabinet radio is past. Atwater Kent has found a way of letting you select a cabinet just as you select other choice pieces of furniture for your home.

First, you decide (as so many others are doing) that your radio must be an Atwater Kent Screen-Grid. This settles the question of performance. Then you make up your mind what sort of cabinet will be appropriate for *your* home—and what price you wish to pay.

This new option in selecting beautiful radio cabinets is yours because not one or two, but *many*, of America's finest makers of furniture, each building to his own design, are making cabinets expressly for Atwater Kent Screen-Grid Radio. Each cabinet is worthy of the set it encloses—and of your home.

On the Air

Atwater Kent Radio Hour, Sunday Evenings, 9:15 (Eastern Daylight Time) WEAF network of N.B.C.

On the Air

Atwater Kent Mid-Week Program Thursday Evenings, 10:00 (Eastern Daylight Time) WJZ network of N.B.C.

ATWATER KENT MANUFACTURING COMPANY *A. Atwater Kent, President* 4822 Wissahickon Ave., Philadelphia, Pa.

Your Children ___ ___ is their food safe?

Even the best food becomes unsafe to eat unless it is *kept* at the proper degree of cold, which medical authorities agree should be 50 degrees or less—always. Above that temperature, bacteria multiply, food spoils—becomes a menace to health.

There is only one way to be sure that your children's food is fresh and healthful—correct refrigeration. There is one refrigerator that assures you of scientifically perfect refrigeration at all times — the General Electric. Faithfully, automatically, quietly, day and night, it maintains a temperature safely below the danger point—50 degrees.

The General Electric is ideal for the home. Its simple mechanism which you never need to oil, is mounted on top of the cabinet and hermetically sealed in a steel casing. It has a simple and accessible freezing regulator, makes a generous supply of ice cubes, creates no radio interference. It has the only *all-steel*, warp-proof cabinet—easily-cleaned, rust-proof and sanitary.

Your dealer will be glad to explain the spaced payment plan, which makes it so easy to own this faithful watchman of the family health. Write Electric Refrigeration Dept., General Electric Co., Hanna Building, Cleveland, Ohio, for booklet R-9.

There are now more than 300,000 homes enjoying the comfort and protection of General Electric Refrigerators—and not one owner has ever spent a single dollar for repairs or service.

The price of this new all-steel refrigerator—the small-family model—is now

$215 AT THE FACTORY

GENERAL ELECTRIC

ALL-STEEL REFRIGERATOR

Join
the Book-of-the-Month Club
now—while you can get
The First Book *FREE*

A GREAT many people (we know) have been on the verge of joining the Book-of-the-Month Club, but have neglected to do so largely through oversight. This special offer is made, frankly, to overcome this procrastination by making it worth while for you not to delay longer. We suggest simply that you get full information at once about what the Book-of-the-Month Club does for you, and then decide once for all whether you want to join. The mere fact that over 100,000 judicious book-readers already belong to the organization—that they represent the elite of the land in every profession and every walk of life—that not a single one was induced to join by a salesman or by personal solicitation of any kind, but did so after simply reading the facts about what the Club does for book-readers—all these are indications that it is worth your while at least to get these facts as quickly as possible, and then (if you want to) join and get your first book free. You assume no obligation in sending the coupon below for full information.

Six distinguished foreign authors now serve as an International Advisory Committee for the Book-of-the-Month Club. The function they perform is to keep our judges advised about what they consider the significant new books published abroad, each in his own country. The Committee consists of:

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and
Arnold Bennett

FOR FRANCE:
André Maurois

FOR GERMANY AND AUSTRIA:
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and
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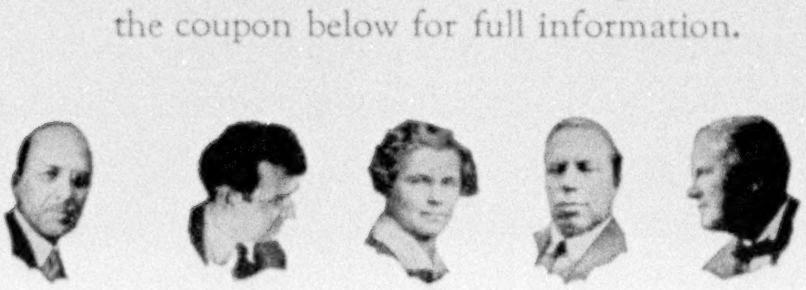
Sigrid Undset



Henry Seidel Canby *Chairman* · Heywood Broun · Dorothy Canfield · Christopher Morley · William Allen White

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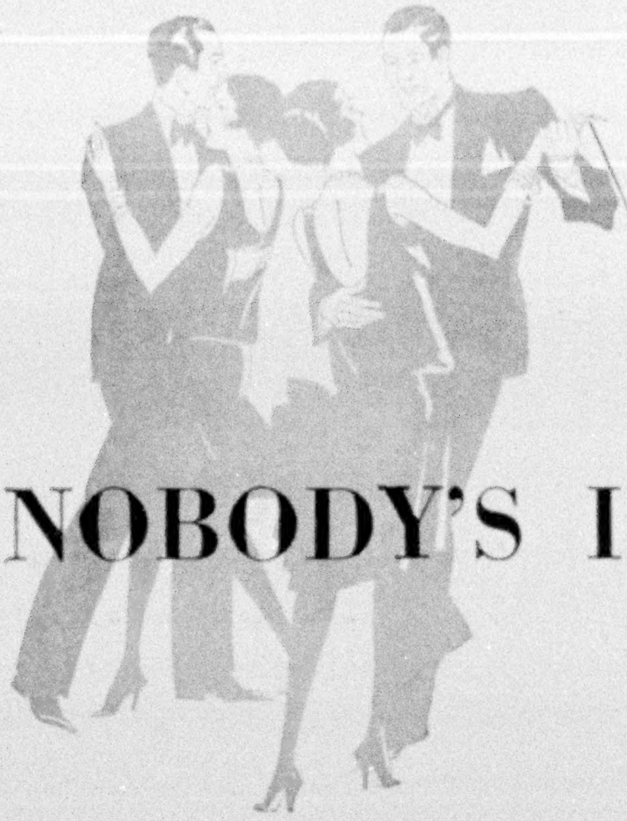
Even when teeth are white



NOBODY'S IMMUNE*

*4 out of 5 Neglect the Gums and Surrender Health to Pyorrhea

DANGER seems so remote when teeth are white. But, as your dentist will tell you, teeth are only as healthy as the gums. And diseases that attack the gums seldom reveal their presence until too late. Once they get a good foothold in the mouth only expert dental treatment can stem their advance.

So start taking proper care of the gums to preserve teeth and safeguard health from dread Pyorrhea—the disease of neglect that ravages 4 persons out of 5 after forty and thousands younger.

Every morning and every night, when you brush your teeth, brush gums vigorously with the dentifrice specifically made for this purpose—Forhan's for the Gums.

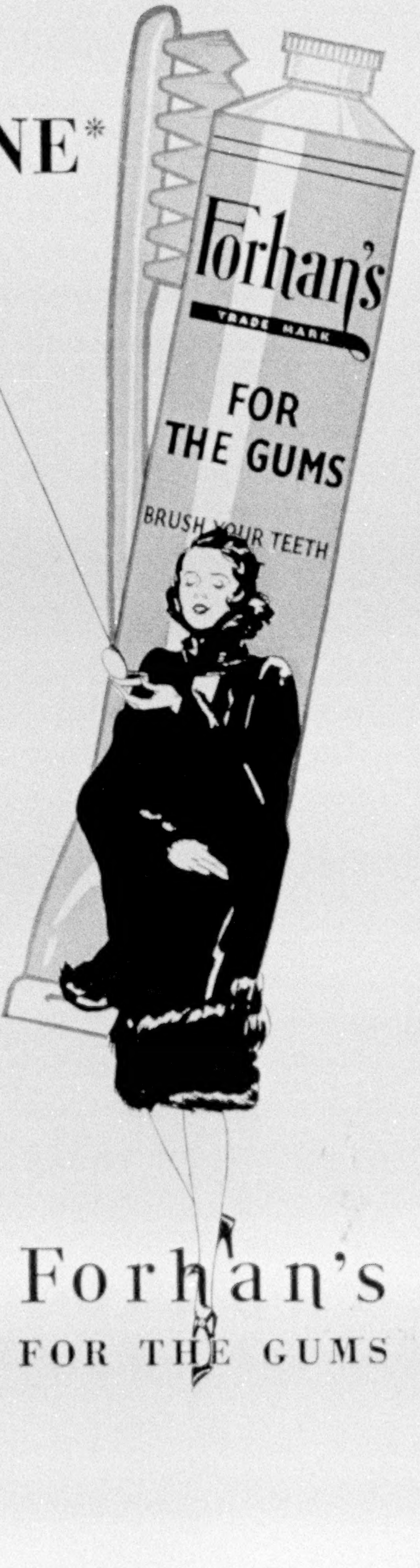
Within a few days you'll notice an improvement in the way your gums look and feel. In addition, your teeth will look cleaner and whiter. For while this dentifrice helps to firm gums and keep them youthful (the surest safeguard against Pyorrhea) it also cleans teeth and protects the crevices where decay so often begins.

Your surest safeguard against disease is a semi-annual visit to your dentist and the daily brushing of teeth and gums with Forhan's.

Get a tube of Forhan's from your druggist today. Two sizes—35c and 60c. Start using it, morning and night. Teach your children this good habit. It will protect their health. Forhan Company, New York.

Forhan's for the Gums is far more than an ordinary toothpaste. It is the formula of R. J. Forhan, D. D. S. It is compounded with Forhan's Pyorrhea Liquid used by dentists everywhere. You will find this dentifrice especially effective as a gum massage if the directions that come with each tube are followed closely. It's good for the teeth. It's good for the gums.

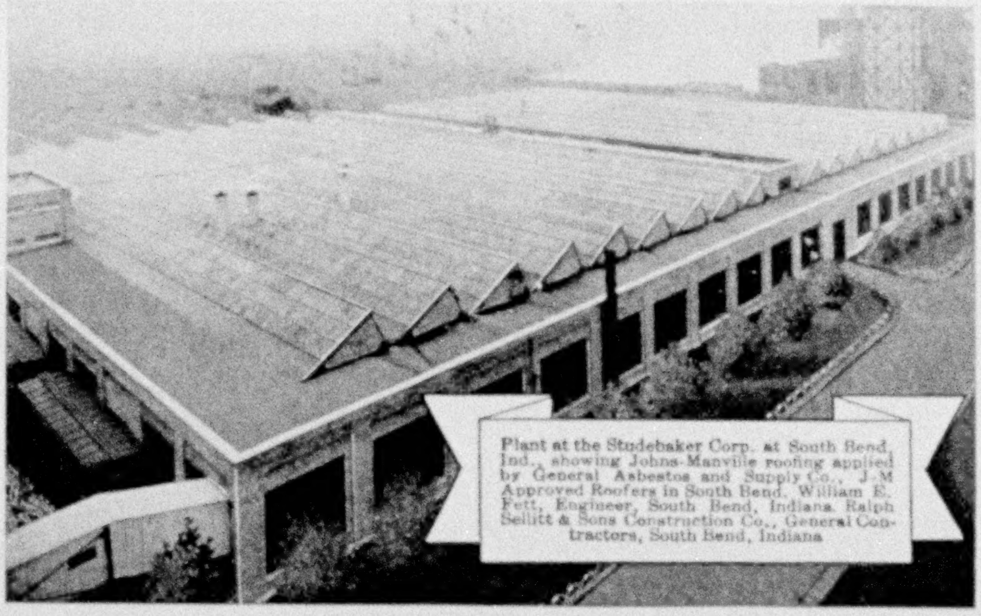
YOUR TEETH ARE ONLY AS HEALTHY AS YOUR GUMS



Forhan's
FOR THE GUMS

The **1944 Studebaker** *will be built under this* **J-M Asbestos Roof**

For years to come the Roof of this Great Motor Car Plant will Cost its Owners Nothing for Repairs



Plant at the Studebaker Corp. at South Bend, Ind., showing Johns-Manville roofing applied by General Asbestos and Supply Co., J-M Approved Roofers in South Bend. William E. Fett, Engineer, South Bend, Indiana. Ralph Sellitt & Sons Construction Co., General Contractors, South Bend, Indiana

THERE are nearly five acres of Johns-Manville Bonded Roofs on six of the new buildings of the Studebaker Corporation at South Bend, Indiana. More than half of the area of the new machine shop shown here, is laid on the slopes of the "saw tooth" construction.

Because every J-M roof is made of materials exactly right for the purpose, and because every J-M roof is laid by expert roofers, Studebaker officials may safely forget this roof for the next 15 years. They know the J-M guarantee states that for at least 15 years this roof will be weather-tight and in good condition. And to support this guarantee there is a 15-year surety bond.

Your own roofing problems can be solved by Johns-Manville. Do you want a twenty-year roof or are you interested in some more temporary structure? Whatever your building, however many years it should stand, there is a J-M roof exactly suited for it.

There are more than twenty types of J-M Bonded Roofs. To meet the varied roofing requirements of modern building, Johns-Manville provides more than twenty distinct types of Built-up Roofs, covered by surety bonds for 20, 15 or 10 years.

A Roof of J-M Standard for Every Building

There is no industrial building for which Johns-Manville cannot provide a roof of maximum safety and life. The J-M 20-year Bonded Asbestos Roof is a smooth surface built-up roof made of all-asbestos felts and J-M asphalt roofing cement, finished with a coating of J-M asphalt roofing cement to provide a smooth, uniform appearance.

A final link between Johns-Manville and a finished J-M Roof, is the supervision by a J-M Roof Inspector on every bonded roof, making certain of workmanship and thoroughness in every detail. After roofs are in place, J-M Inspectors make return inspections at regular intervals to remedy any unforeseen trouble before it reaches the serious stage — practical Life Extension for your roof.

JM Johns-Manville

BONDED ASBESTOS ROOFS

JOHNS-MANVILLE CORPORATION
New York Chicago Cleveland San Francisco Toronto
(Branches in all large cities)

Please send me your new booklet ____________

____

Name ____________________ *Address* ____________________

Bu-41-9

The Finest June Lilies

Royal Lily
LILIUM REGALE

MADONNA LILIES (*Lilium Candidum*) and Royal Lilies (*Lilium Regale*) are the loveliest of all the Lilies. They flower from mid-June to early July, at the time when gardens are sweetest and best and can be had in abundance by all who have a garden.

Our bulbs are strong and well cured, ready for planting after October 1st, so that they can make strong root growth for next June's glorious flowers.

Both the Madonna and Royal Lily should be planted in quantity in every garden. They are suited to any position in the garden. Planted 8 inches apart in clumps of 5 to 25 bulbs each, they contrast well with the tall pyramidal blue spikes of Delphinium.

Few, if any, of the hardy garden Lilies excel the Madonna Lily or Royal Lily in ease of culture or delightful fragrance.

American Grown Bulbs

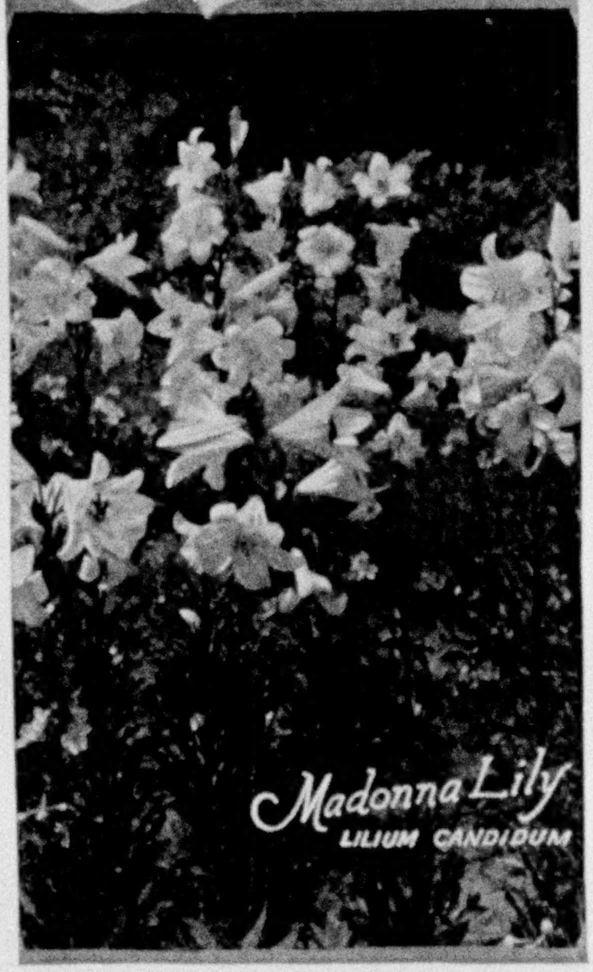
Royal Lily

(*Lilium Regale*)

Beautiful waxen trumpets of pure white inside, flushed with golden yellow in the throat, and stained pink and tan outside. The stalks are two to five feet high and bear from one to twelve or more magnificent blooms at once at the top. They are strong as steel, but bend in a friendly way as if to greet the passerby and offer their blossoms for admiration. They require no special soil, and look splendid planted upon banks and along the top of walls, in clumps of 5 to 25 in the herbaceous border, or along paths, or in front of Evergreens. Bulbs should be planted so that they are covered about 5 inches from the top of the bulb; a handful of sharp builder's sand immediately beneath the bulbs helps provide better drainage.

Selected Bulbs

4 to 5 inches in circumference
$3.50 per Doz.; $25.00 per 100
5 to 6 inches in circumference
$4.00 per Doz.; $30.00 per 100



English Grown Bulbs

Madonna Lily

(*Lilium Candidum*

The oldest and most popular of all the Lilies, it has been beloved since men first began to make gardens. It grows erect, with snowy flowers in a spike near the tip of the stalk, and holds itself in chaste and simple loveliness above all other flowers. When established it endures for years, growing finer and increasing with age, becoming a family heirloom of imperishable beauty.

The bulbs we offer are grown for us by a specialist in England, *land of gardens*, and are ripe and strong, ready to spring into growth as soon as they are planted. We do not offer Bulbs of Madonna Lily grown in the South of France as these are not suitable for Garden planting.

Owing to our having large quantities of these bulbs, grown on contract for us, we can offer them at **Popular Prices**, to encourage larger plantings of this wonderful Lily. Bulbs when planted should be set slightly on their side, covered with 2 inches of soil; a handful of sharp builder's sand placed beneath the bulbs helps provide better drainage.

Selected Bulbs

7 to 8 inches in circumference
$2.50 per Doz.; $20.00 per 100
8 to 9 inches in circumference
$3.50 per Doz.; $25.00 per 100

Our Catalog—*"Bulbs for Autumn Planting"*

Is now ready—please send for a copy. It features the New and Rare varieties of Flower Bulbs from America, Holland, France and Japan. The Finest Tulips, Daffodils, Hyacinths, Crocus, Lilies and other Miscellaneous Bulbs for Autumn Planting.

Order Your Bulbs Now!

Stumpp & Walter Co
30-32 Barclay Street, New York

One of the Largest Growers and Importers of American, Dutch, French and Japanese Bulbs for Discriminating Flower Lovers in the United States

This book club gives you 12 *important* New Books

for the price of one! $5.00

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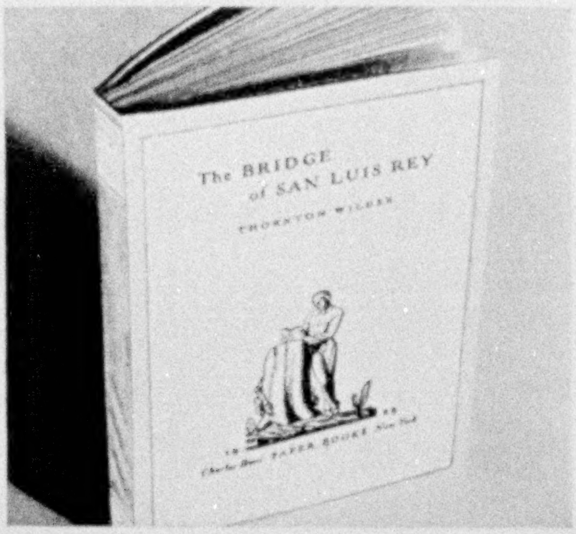

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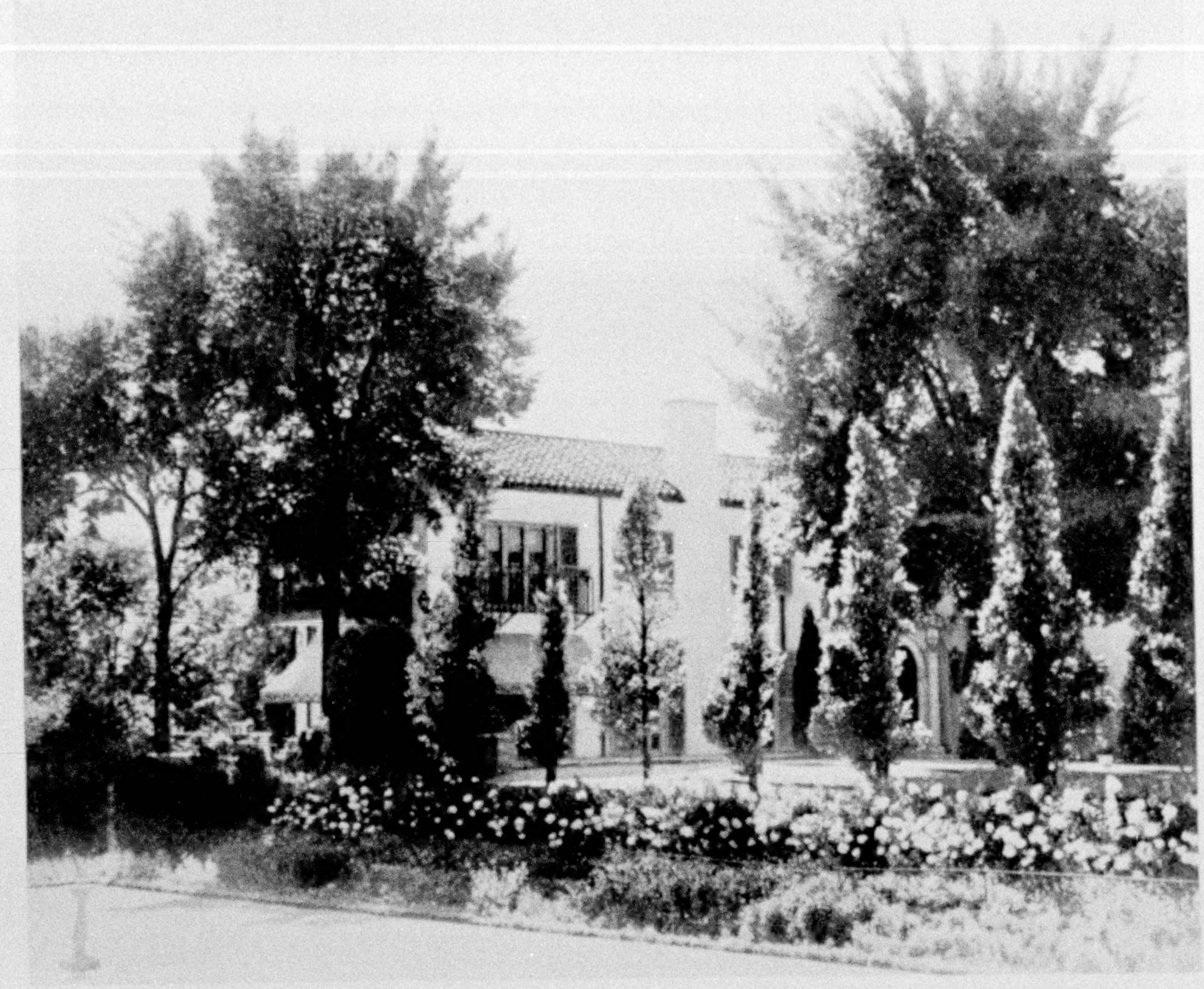

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Reproduction from a color photograph of El Contento, the estate of Warren Wright, Golf, Illinois, by Wilfred O. Floing

A science, a philosophy, an ideal

Most people have had an instinctive love of nature, even before the time when "the groves were God's first temples." But few seemed to realize that trees were actually living, breathing things and subject to disease and death. More particularly, no one ever dreamed that anything could be done to save them.

Then John Davey came into the world; and because he was an unusual lover of nature, he chose to acquire training in horticulture.

Before his time trees were more or less generally the victims of neglect and often of abuse. John Davey conceived a great idea; he studied the sciences to provide a basis for his theories, and then worked out a systematic method of treating trees to save them. This was nearly a half century ago.

Only occasionally is a man permitted to give the world a new idea. John Davey did more than this. He created a philosophy, built around his new science and based on the essential principle that the tree is a living, breathing organism.

To him this whole thing became a great ideal. Under his forceful and devoted leadership there was developed a system of principles in practice and conduct, of business and professional ethics.

No man can continue in the Davey Organization, although John Davey has been dead six years, unless he remains true to the science, the philosophy and the ideals of the founder. You can trust Davey Tree Surgeons. They will do only those things that ought to be done in your interest.

THE DAVEY TREE EXPERT CO., Inc., 239 City Bank Bldg., Kent, Ohio

Send for local representative to examine your trees without cost or obligation

Among prominent persons and institutions served by the Davey Tree Surgeons are the following:

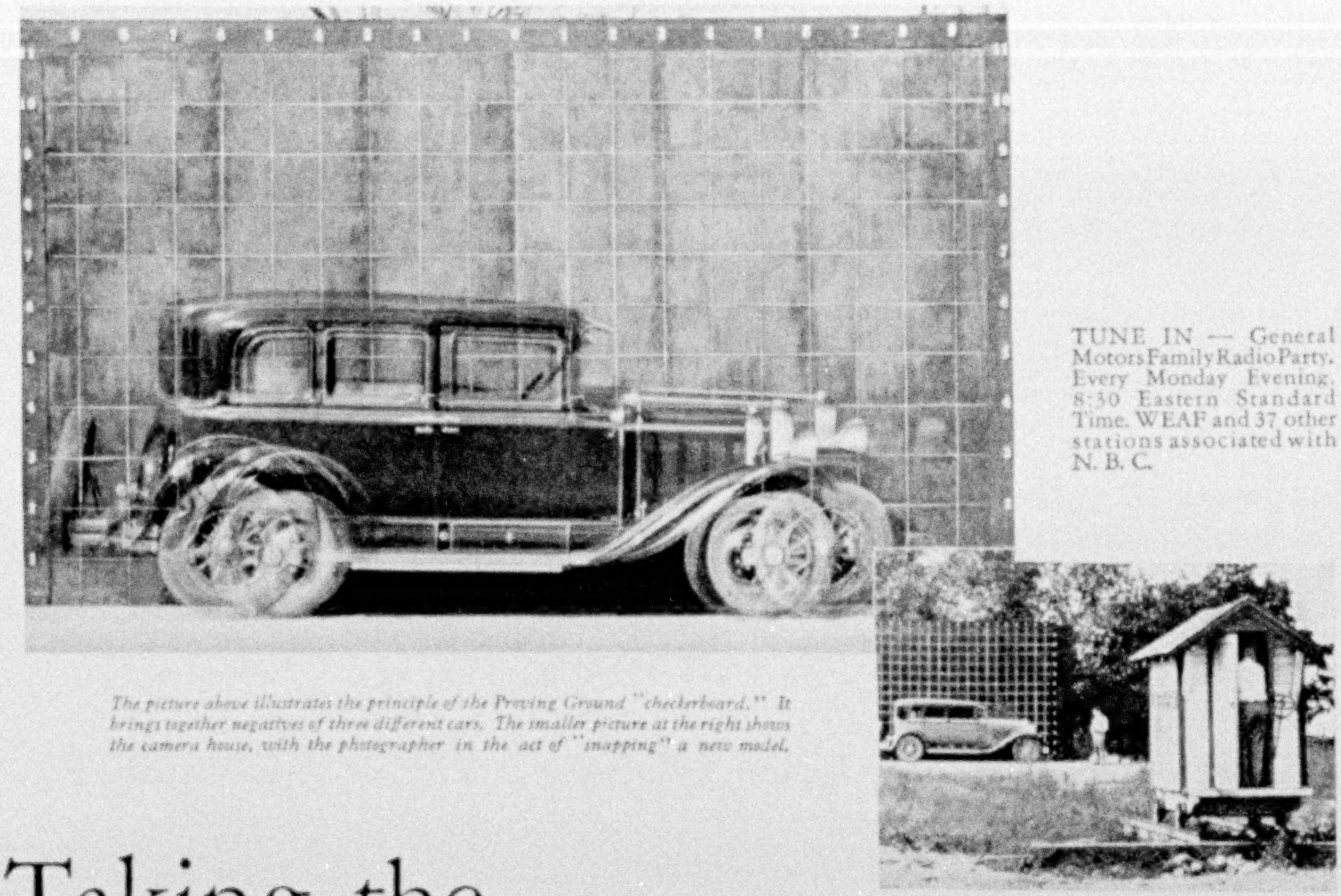
HON. EVANS WOOLLEN
GREENWICH, CONN. TREE ASSOCIATION
ERLANGER COTTON MILLS
MICHAEL F. CUDAHY
KANSAS CITY PARK BOARD
SIR THOMAS TATE
RANDOLPH-MACON SCHOOL
ROBERT BACON FARM
RUTH DEAN
C. SIDNEY SHEPARD

JOHN DAVEY
1846-1923
Father of Tree Surgery
Reg. U. S. Pat. Office

DAVEY TREE SURGEONS

MARTIN L. DAVEY, *President and General Manager*

No. 6. *Inside pictures of the General Motors Proving Ground*



TUNE IN — General Motors Family Radio Party. Every Monday Evening, 8:30 Eastern Standard Time. WEAF and 37 other stations associated with N. B. C.

The picture above illustrates the principle of the Proving Ground "checkerboard." It brings together negatives of three different cars. The smaller picture at the right shows the camera house, with the photographer in the act of "snapping" a new model.

Taking the new car's picture

ALL new cars have their pictures taken against this checkerboard background at General Motors Proving Ground. By superimposing the negatives one upon another, General Motors engineers can study the trend in body designs and keep ahead in anticipating public taste in motor car style and comfort.

The Proving Ground occupies 1268 acres near Milford, Michigan, convenient to all General Motors car divisions. It is a great "outdoor laboratory" where automobiles can be tested in a scientific manner under conditions that are exactly comparable. Especially constructed roads and hills duplicate every driving condition.

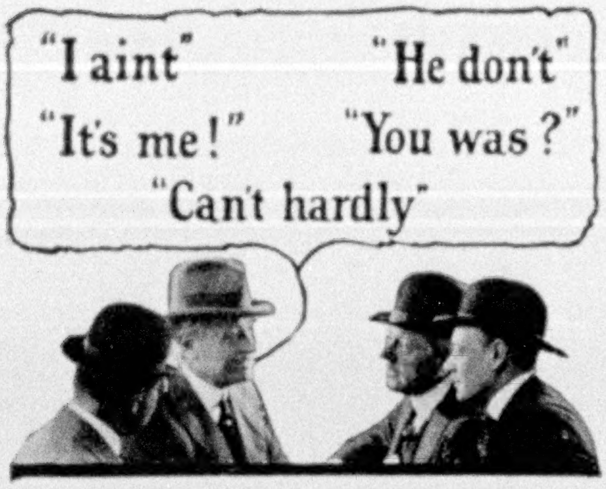
At the Proving Ground the General Motors car divisions thoroughly test and prove their new models before they are offered to the public.

Here also cars of different American and European makes are tested after they are put on the market, thereby enabling General Motors to know precisely how its products compare with others in their respective price classes.

A MOTION PICTURE showing the Proving Ground in actual operation is available in lengths of one, two, or four reels, free of all charges except those of transportation. It may be borrowed by schools, clubs, churches, and other organizations. Please specify whether the 35 or 16mm width is desired and give several weeks' notice in advance of showings. Write to Institutional Advertising Dept., General Motors, Detroit.

"A car for every purse and purpose"

CHEVROLET · PONTIAC · OLDSMOBILE · MARQUETTE · OAKLAND · VIKING
BUICK · LaSALLE · CADILLAC · *All with Body by Fisher*
GENERAL MOTORS TRUCKS · YELLOW CABS *and* COACHES · FRIGIDAIRE—*The Automatic Refrigerator*
DELCO-LIGHT *Electric Power and Light Plants* · DL WATER SYSTEMS · GMAC *Plan of Credit Purchase*



What Are YOUR Mistakes in English?

They may offend others as much as these offend you

If some one you met for the first time made the mistakes in English shown above, what would you think of him? Would he inspire your respect? Would you be inclined to make a friend of him? Would you care to introduce him to others as a close friend of yours?

These errors are easy for you to see. Perhaps, however, you make different mistakes which offend other people as much as these would offend you. How do you know that you do not mispronounce certain words; are you always sure that the things you say and write are grammatically correct? To *you* they may seem correct, but others may know that they are wrong.

Unfortunately, people will not correct you when you make mistakes; all they do is to make a mental reservation about you. "He is ignorant and uncultured," they think.

FREE BOOK ON ENGLISH Sherwin Cody, perhaps the best known teacher of practical English, has perfected and patented a remarkable device which will quickly find and correct mistakes you unconsciously make. Correct English soon becomes a HABIT.

Mr. Cody's remarkable new invention, the 100% Self-Correcting Method, has already improved the English of more than 50,000 persons. No useless rules, no tedious copying, no hard study. Only 15 minutes a day required.

A new book, "How to Speak and Write Masterly English," is ready. It explains Mr. Cody's surprisingly easy method. Get a copy free and learn how to stop making embarrassing errors. You do not want others to judge you unfairly. Merely mail the coupon or a postal card. SHERWIN CODY SCHOOL OF ENGLISH, 389 Searle Building, Rochester, N. Y.

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Please send me your free book, "How to Speak and Write Masterly English."

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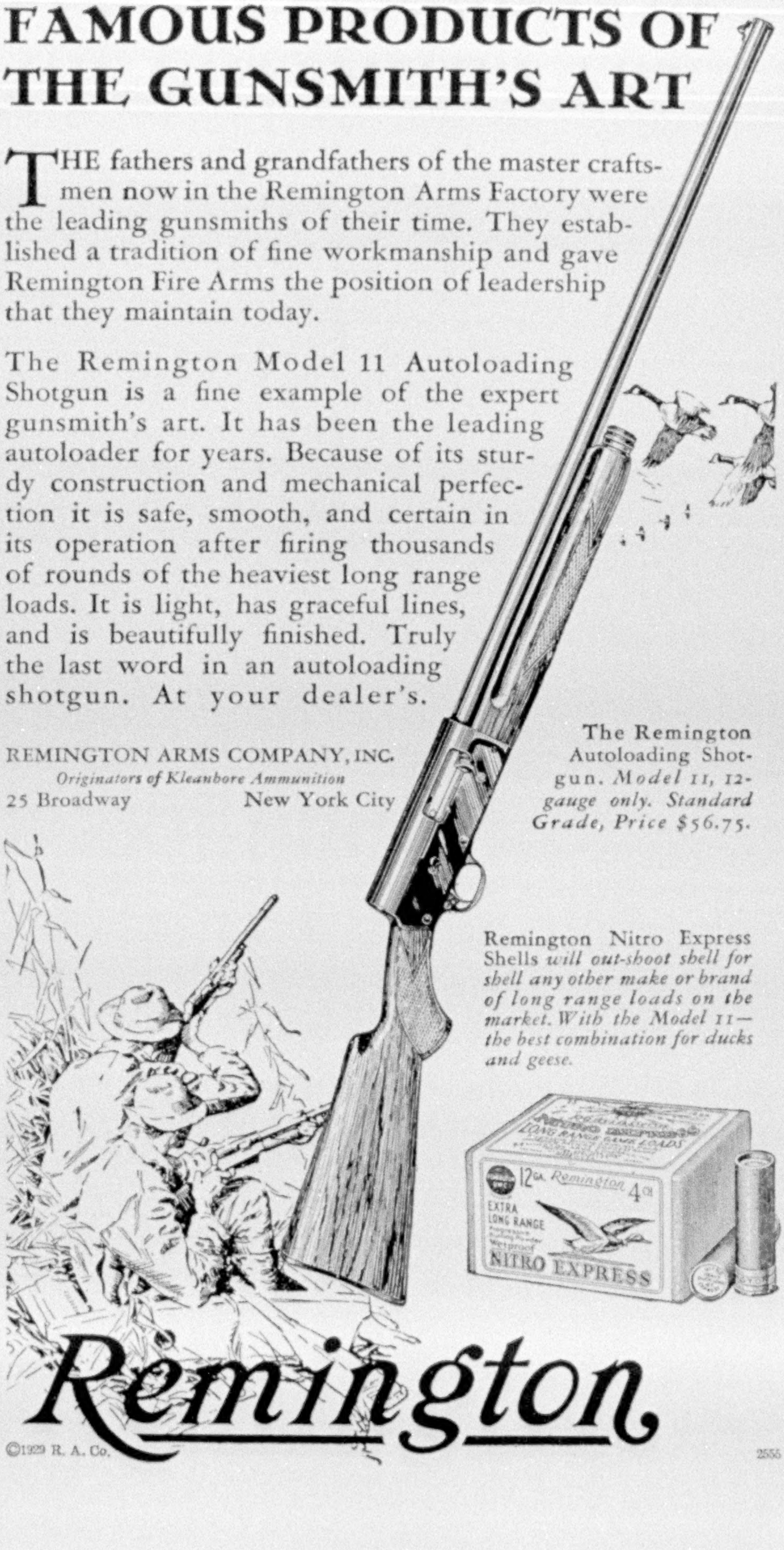
THE fathers and grandfathers of the master craftsmen now in the Remington Arms Factory were the leading gunsmiths of their time. They established a tradition of fine workmanship and gave Remington Fire Arms the position of leadership that they maintain today.

The Remington Model 11 Autoloading Shotgun is a fine example of the expert gunsmith's art. It has been the leading autoloader for years. Because of its sturdy construction and mechanical perfection it is safe, smooth, and certain in its operation after firing thousands of rounds of the heaviest long range loads. It is light, has graceful lines, and is beautifully finished. Truly the last word in an autoloading shotgun. At your dealer's.

REMINGTON ARMS COMPANY, INC.
Originators of Kleanbore Ammunition
25 Broadway New York City



The Remington Autoloading Shotgun. *Model 11, 12-gauge only. Standard Grade, Price $56.75.*

Remington Nitro Express Shells *will out-shoot shell for shell any other make or brand of long range loads on the market. With the Model 11—the best combination for ducks and geese.*

Remington

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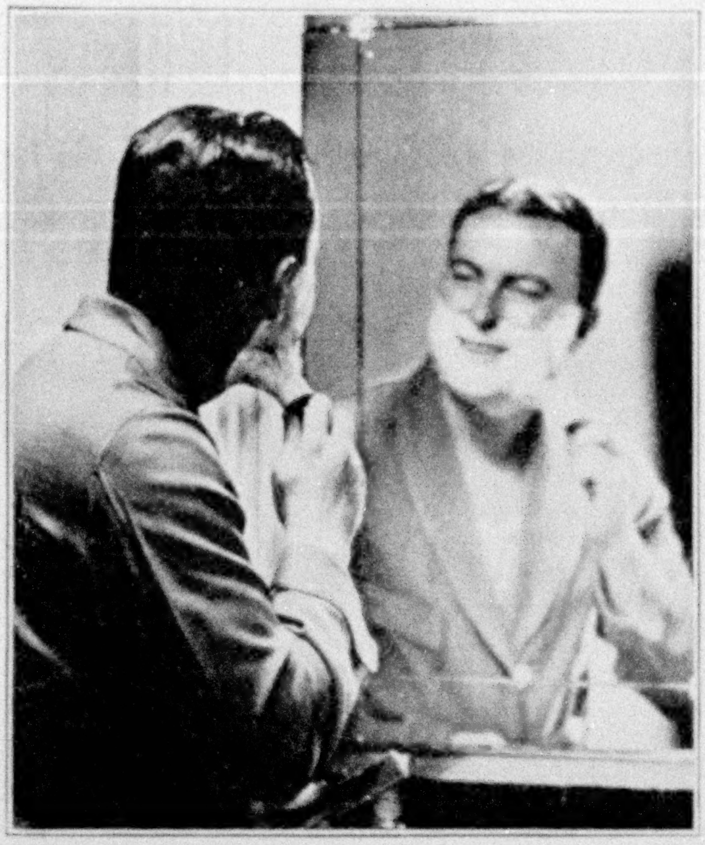

Our Biggest *Job*

To get men to make our 7-day test. 86% of those who try this amazing shaving cream, we find, never return to old methods.

GENTLEMEN: You've heard men say: "I never clip the coupons out of ads." Yet we have something so unique that many have cut their *first* coupon out of ours.

For, after years of experiment, we have perfected a shaving cream that men tell us is outstanding. They claim for it things that we, in modesty, could never say.

Our method of presenting it is this: Try it, at our expense, for a week before you buy. Then, if you like it—as 86% of those who try it do—you can buy it at stores wherever you are.

5 remarkable points

1. Multiplies itself in lather 250 times.
2. Softens the beard in one minute.
3. Maintains its creamy fullness for 10 minutes on the face.
4. Strong bubbles hold the hairs erect for cutting.
5. Fine after-effects due to palm and olive oil content.

Now try it, please

Now, whether your old shaving preparation suits or not, try ours. *You* risk nothing. *We* undertake, in 7 shaves, to win you. It's an open-and-shut proposition, and you are the judge. So won't you mail the coupon now?

PALMOLIVE RADIO HOUR — Broadcast every Wednesday night—from 8:30 to 9:30 p. m., Eastern time; 7:30 to 8:30 p. m., Central time; 6:30 to 7:30 p. m., Mountain time; 5:30 to 6:30 p. m., Pacific Coast time—over station WEAF and 39 stations associated with The National Broadcasting Company.

To add the final touch to shaving luxury, we have created Palmolive After Shaving Talc—especially for men. Doesn't show. Leaves skin smooth and fresh—gives that well-groomed look. Try the sample sent free with the Shaving Cream. Clip and mail the coupon now.

4671

7 SHAVES FREE

and a can of Palmolive After Shaving Talc

Simply insert your name and address and mail to Dept. B-3045, Palmolive, P. O. Box 375, Grand Central Post Office, New York City.

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(Please print your name and address)

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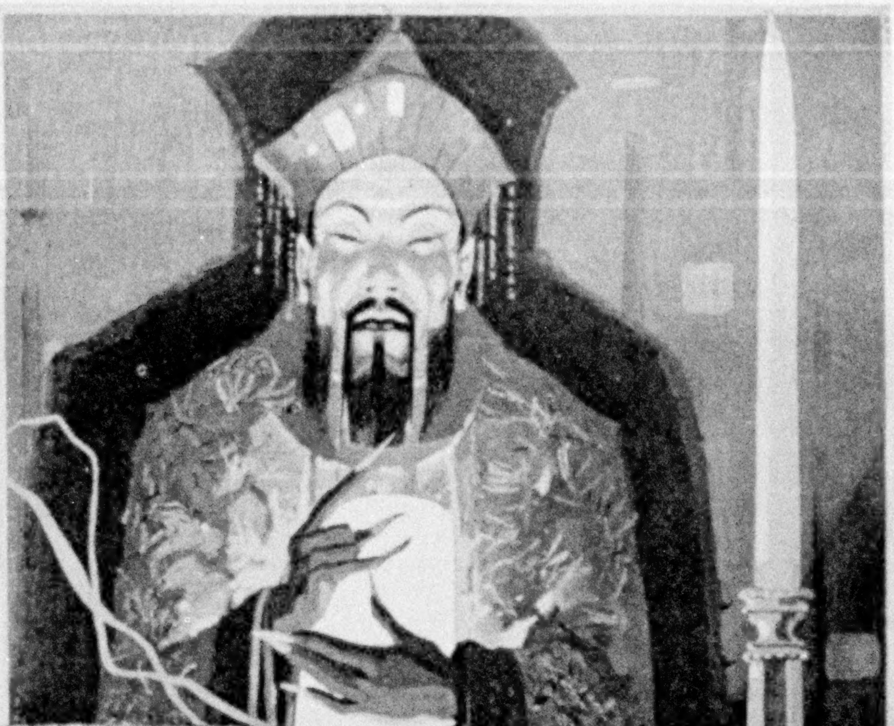

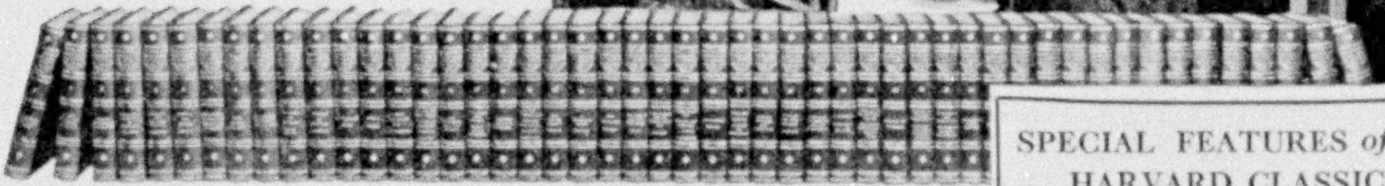

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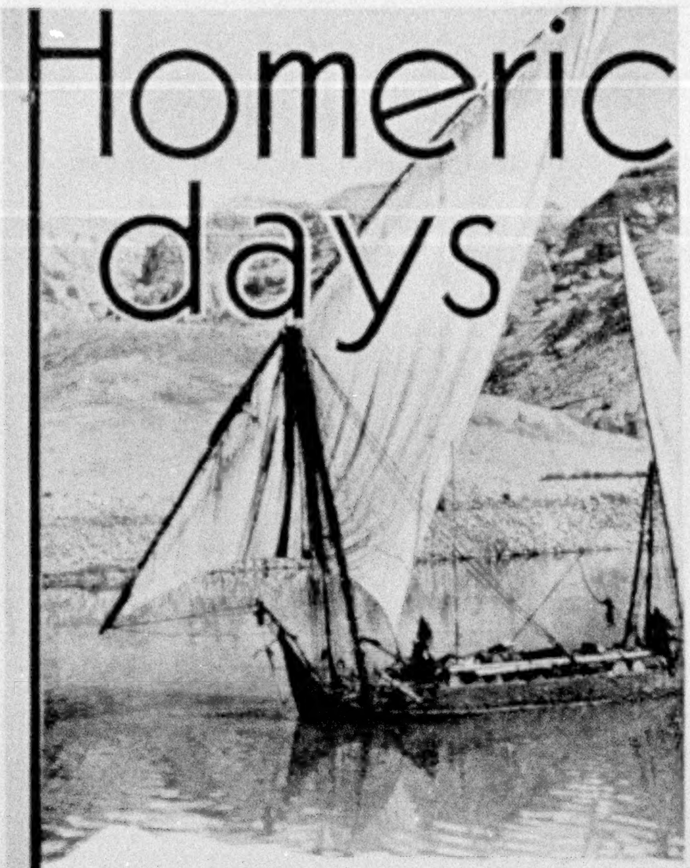
Homeric days



A boat on the Nile

Directly before you is the Sphinx—the Pyramids. Off in the distance is Cairo. Cairo—the magnificent, the mysterious. The thrilling, throbbing Orient. Cairo, the ancient—the unchanged civilization of a thousand years. Bournous-clad men. Veiled women. Carnival-like Bazaars. Hustle and bustle. Dark, narrow streets. Mosques, Minarets, Arabs, camels, donkeys, hawkers. A gasp, a laugh, a thrill every second. Faster than you can take it all in. That is Cairo. And Cairo is but one of the many dazzling Arabian Night's adventures on the

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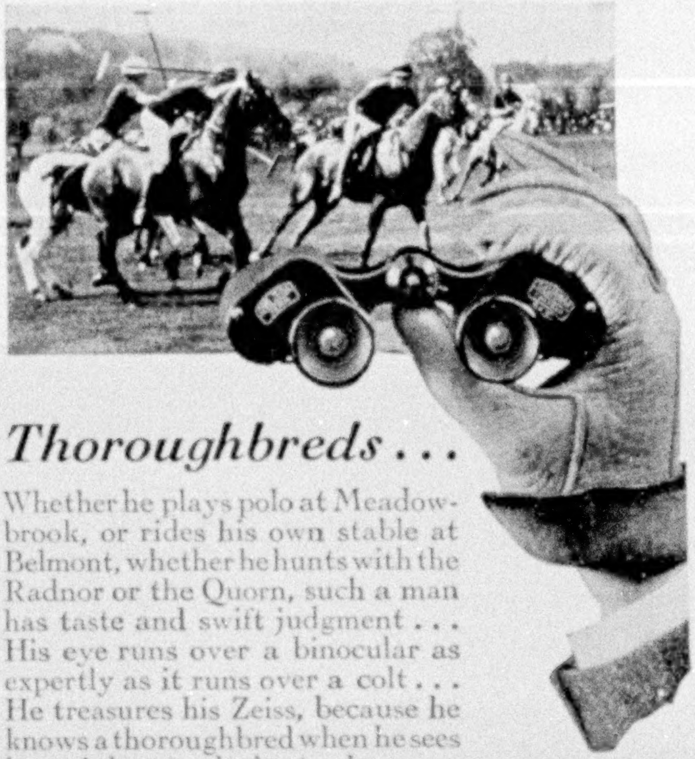

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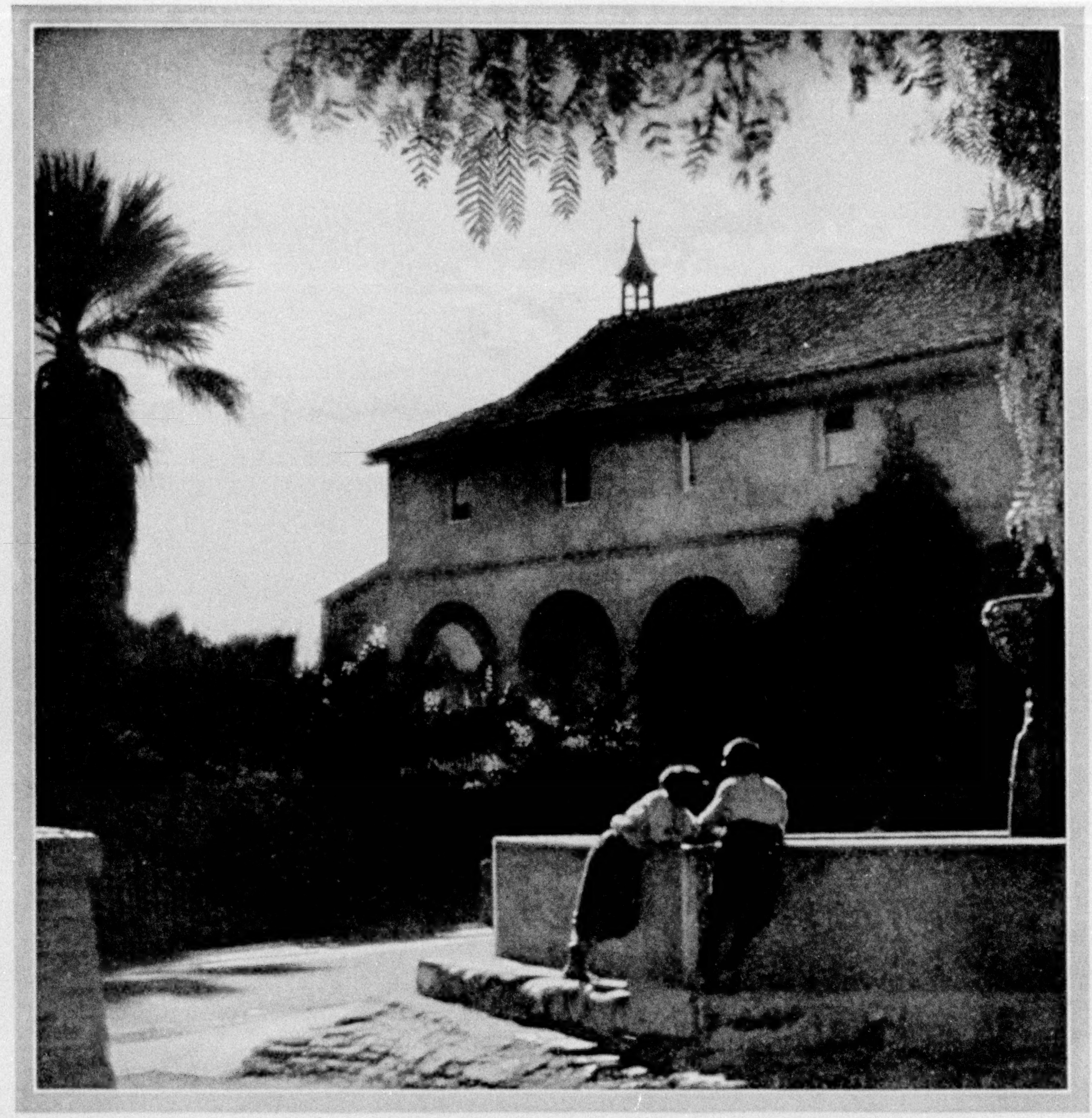

Santa Barbara's old Spanish Mission enjoys a never-ending appeal to visitors in California

FULFILL your desire of a lifetime. Plan now to relax in the warm, energizing sunshine of Southern California's fall and "winter" months. *Bring the family.* Put the children in the fine modern schools.

Ever-blooming flowers, ripening oranges, close-by mile-high mountains, palm-lined boulevards that lead to Old Spanish Missions; the desert—"*winter*" *as Southern Californians know it.* Living costs are no higher than at home.

Out here, life takes on new meaning. There is everything—*or nothing*—to do. Entertainment is at its peak,—and endless—if you seek it. Golf in every direction, tennis, saddle sport, polo; the Tia Juana races and Mexican Monte Carlo at Agua Caliente; motoring on 5,000 miles of boulevards.

Los Angeles, Pacific Coast metropolis, has outstanding resort hotels, theaters and cafes. Los Angeles County, with its charming suburban cities, vast oil fields and an agricultural output approximating $95,000,000 yearly, is among the richest in the country.

Pack up and come. *Experience a Christmas under the orange trees!* Mail the coupon for a de luxe book, "Southern California through the Camera," containing 71 large pictures in gravure.

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Design by Herbert M. Greene

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"Thank God! At last I'll be able to read and write."

HOW would you feel if you could not read the news of the world? No newspapers, magazines, books, letters, not even a danger sign or a warning notice?

Somewhere near you is a grown person groping in the dark, in many ways helpless as a child, because he cannot read or write. You can bring sunlight into his darkened life. More than that, you may be the means of bringing him better health—even of saving his life.

Today he cannot read messages on disease prevention. He does not know, unless someone tells him, the important rules of health or how to keep his family from having diphtheria, smallpox or typhoid fever. These and other preventable diseases often make illiterate localities their breeding places and thus endanger the health of the educated, despite all their precautions.

Perhaps you share the mistaken belief that it is impossible to teach grown-up illiterates how to read and write and that they are content to be illiterate.

Get the confidence of an illiterate and ask him if he would like to be able to read and write. Tell him he can learn to write his name in 30 minutes and learn to read in a few months. In all probability his eager response will amaze you.

It may surprise you to learn that the majority of illiterate persons in the United States are native born—more than three million illiterate Americans. Many of them have never had a chance to learn and do not know where to look for instruction.

Illiterates are not hard to find—a servant, a farmhand, an employee in your own or a neighbor's shop, a laundress, a deliveryman, a laborer in your neighborhood.

There are more than 5,000,000 men and women in the United States who cannot read health messages concerning sanitation and prevention of disease—more than 400,000 of them are in the State of New York, more than 300,000 in Pennsylvania, about 150,000 in Massachusetts. You can find them in every State of the Union—in cities, in towns and in country districts.

Will you give someone a present that he would not exchange for hundreds of dollars—the ability to read and write—a present which costs you nothing?

Find *your* illiterate. If you will help him to learn to read and write, the Metropolitan Life Insurance Company will send you, free of cost, grooved writing pads and illustrated lessons for beginners.

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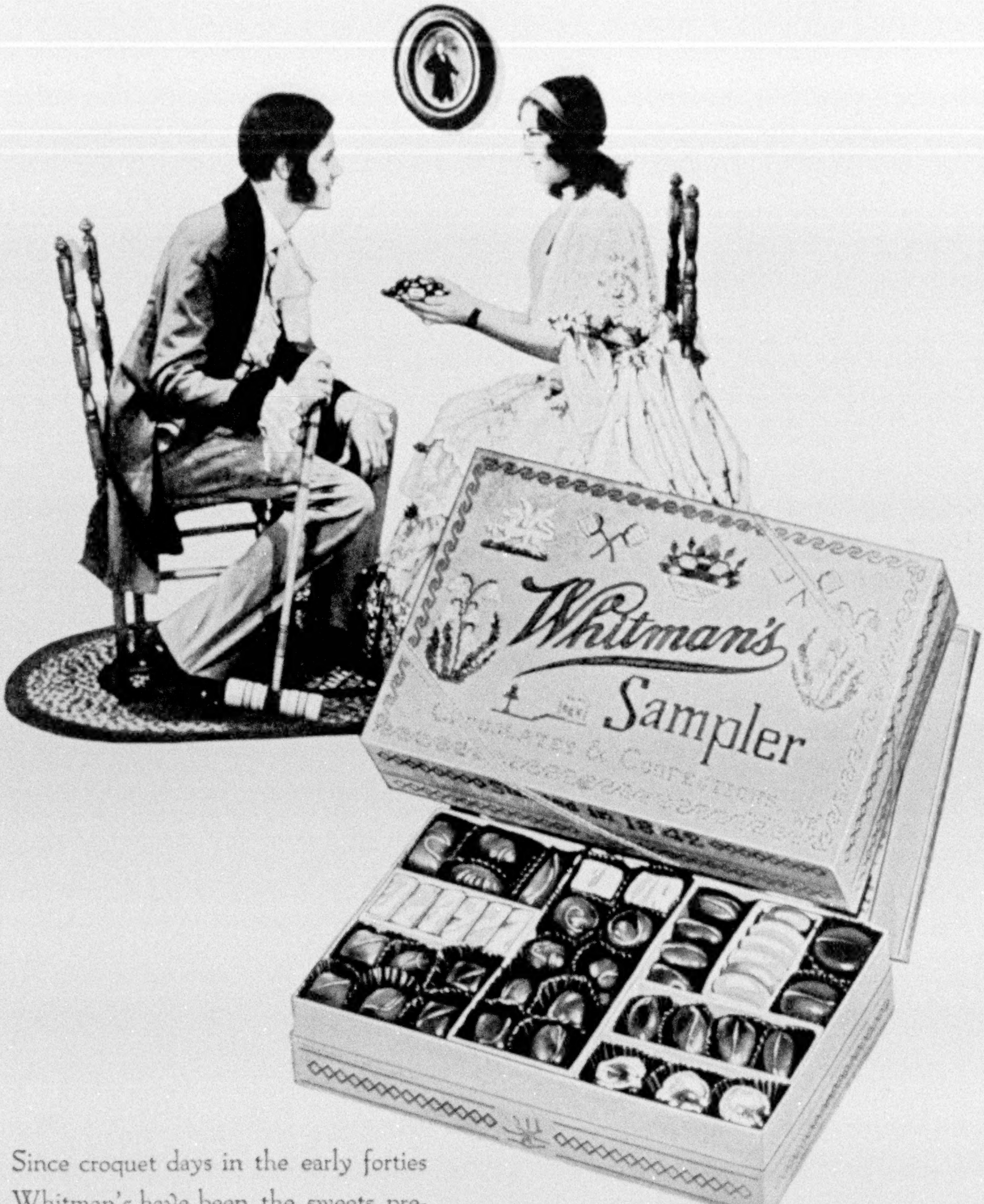

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Vol. LVI, No. 3 WASHINGTON September, 1929

THE NATIONAL GEOGRAPHIC MAGAZINE

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INTO PRIMEVAL PAPUA BY SEAPLANE

Seeking Disease-resisting Sugar Cane, Scientists Find Neolithic Man in Unmapped Nooks of Sorcery and Cannibalism

By E. W. Brandes, Ph. D.

Principal Pathologist-in-charge, Sugar Plant Investigations, and Leader of the New Guinea Expedition

If TO-DAY a stone-age man appeared naked on Broadway, armed with spear and shield or carrying the severed head of a tribal enemy, he might block traffic; for he vanished, in the popular mind, with mastodon, mound builder, and saber-toothed tiger. Newspapers print the item now if a peasant plowman in France merely turns up an ancient stone ax or a tooth necklace, relics of those who toiled, fought, and died before Babylon was built or Moses got stone Tablets of the Law.

Now it is only from wax figures in museums that we commonly get any hint of how our neolithic ancestors lived. There, in glass cases, we see them making tools of polished stone for chopping out their canoes, or for planting haphazard gardens in jungle clearings. "Think of making a boat with no tool but a sharp rock!" one hears museum visitors exclaim. "What a difference the centuries make! Wouldn't primitive man be astonished if he could see us now, with our radio, our high-power rifles, and flying machines!"

NEOLITHIC MAN STILL WALKS THE EARTH

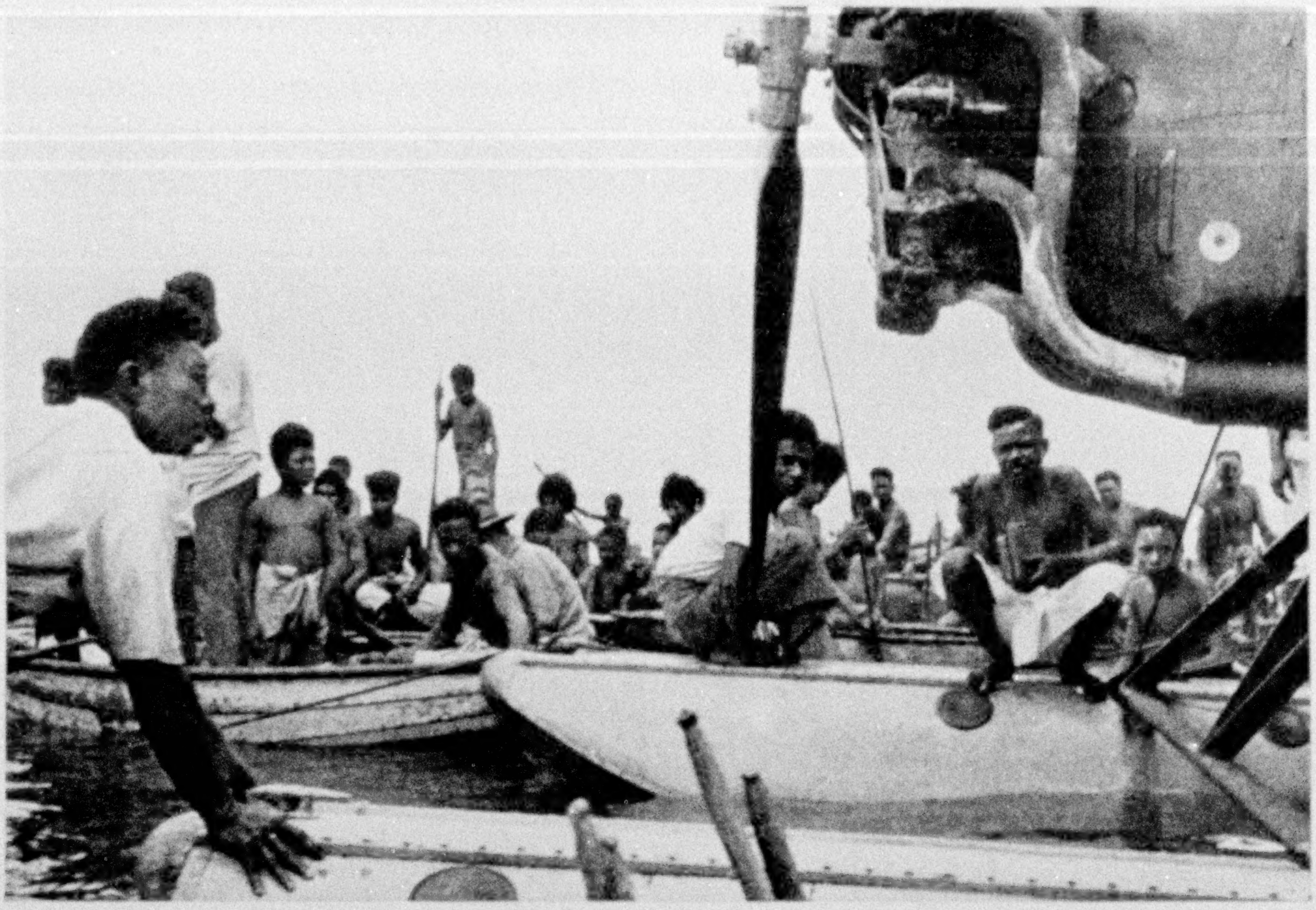
I can say that he would. Moreover, he was!

For the bald truth is that neolithic man has not vanished entirely. In certain far nooks and crannies of the world he lives now just as primitively as he did uncounted thousands of years ago. I found him just so when I alighted from a plane before a cannibal camp in the remote jungles of New Guinea and was mistaken for a god!

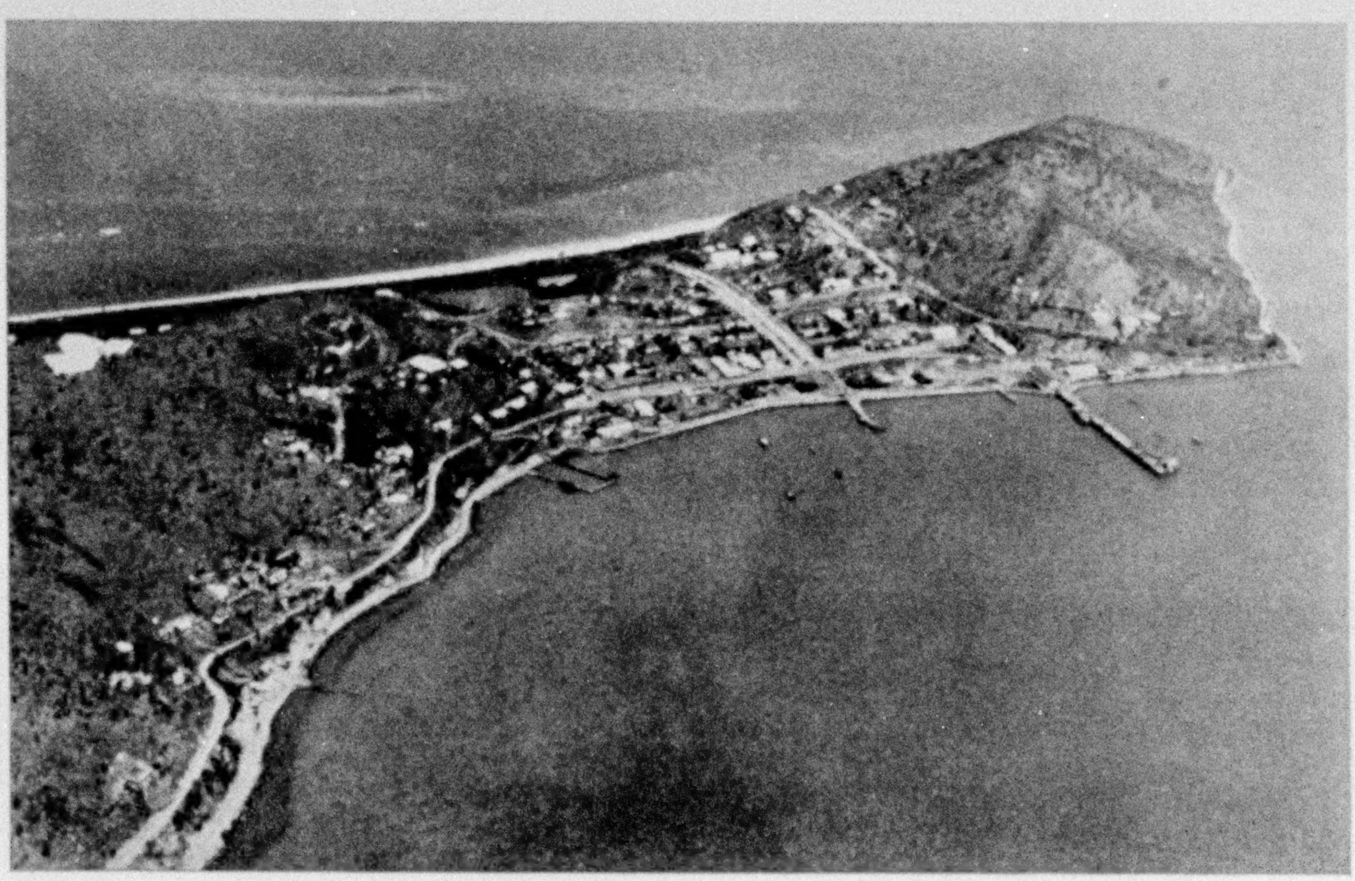
When his first panic was over, I had a chance to study him at work and play. So it came that I saw him fashion his rude stone ax, and tip his arrow with the hard, sharp, bony toenail of a cassowary. He wanted to trade me smoked human heads for old safety-razor blades or empty cigarette tins. To him I, in my "big hawk," as he called it, with my odd clothes and mysterious weapons, was as much of a curiosity as he would be to us should he come now to Broadway. Perhaps even more so; for in all probability he had never even heard of a white race.

Ours *was* a queer experience. Put yourself in our place: face to face with naked wild man at the very dawn of reason, barely groping as yet from brute instincts and abysmal urges, his elemental appetite as yet untempered by the softening conventions of the life struggle as we know it.

In the weeks that we spent with him, how grimly his primitive manners and



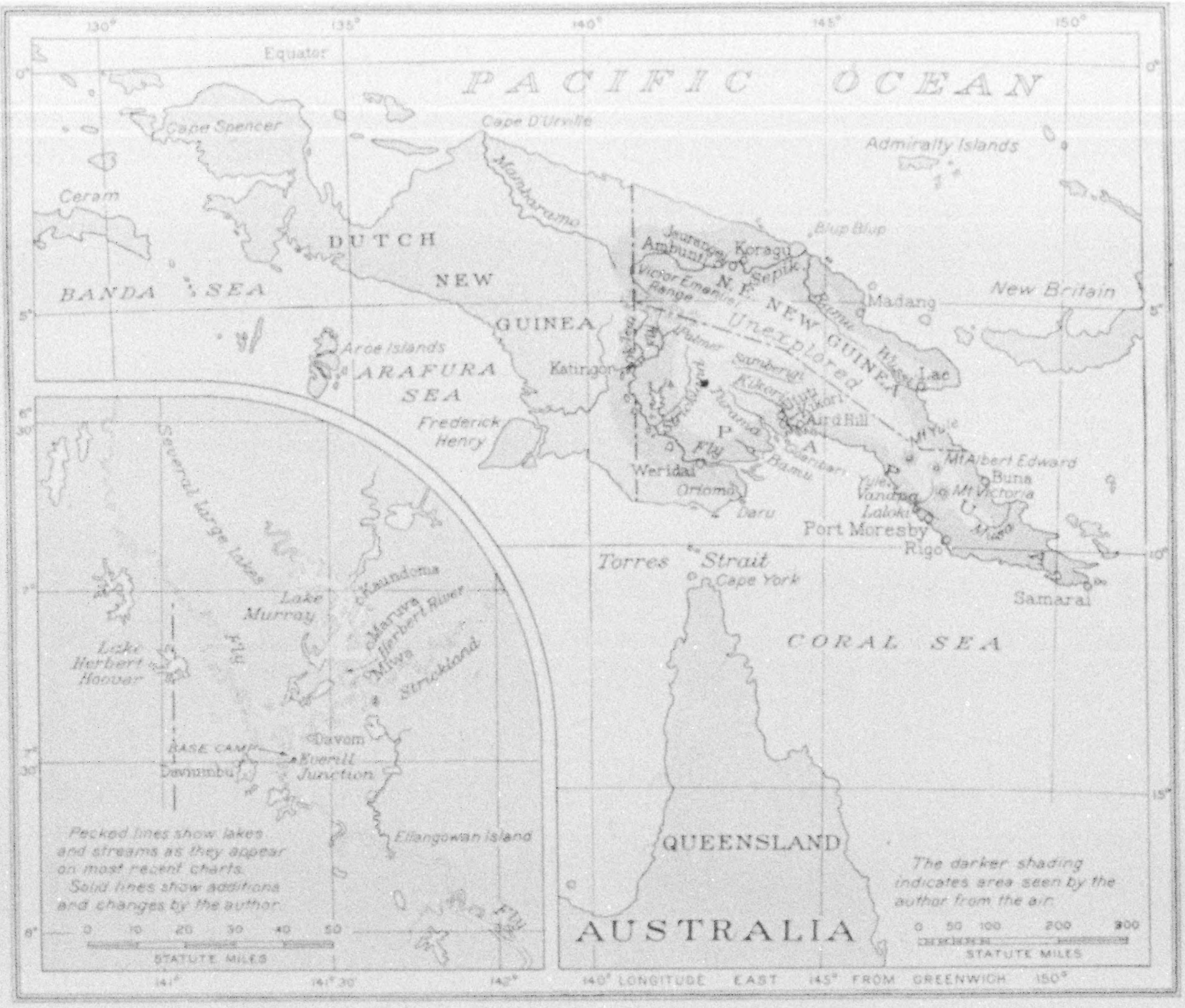
ALL HULA WANTED TO INSPECT THE EXPEDITION'S SEAPLANE (SEE, ALSO, PAGE 256)



Photographs by R. K. Peck

LOOKING DOWN ON PORT MORESBY, CAPITAL OF PAPUA, FROM AN ELEVATION OF 10,000 FEET

On the slope of a hill at the left is a rain-water reservoir, built because of long dry seasons. It was at Port Moresby that the Expedition made its final preparations for the work in the interior.


130°
135°
140°
145°
150°
Equator
0°
PACIFIC OCEAN
Cape Spencer
Cape D'Urville
Admiralty Islands
Ceram
Mamberamo
DUTCH
NEW
GUINEA
BANDA SEA
Ambunti
Koragu
Sepik
Blup Blup
Victor Emanuel Range
N. E. NEW GUINEA
Madang
New Britain
Ramu
Unexplored
Aroe Islands
ARAFURA SEA
Katingon
Palmer
Samberigi
Kikori
Aird Hill
Lae
Frederick Henry
P
A
Fly
Bamu
Weridai
Oriomo
Daru
Mt Yule
Mt Albert Edward
Buna
Mt Victoria
Yule
Vanapa
Laloki
Port Moresby
Rigo
Torres Strait
Cape York
Samarai
CORAL SEA
Several large lakes
Lake Murray
Kaundoma
Maruva
Herbert River
Miwa
Strickland
Fly
Lake Herbert Hoover
BASE CAMP
Davumbu
Davom
Everill Junction
Ellangowan Island
Pecked lines show lakes and streams as they appear on most recent charts. Solid lines show additions and changes by the author.
0 10 20 30 40 50
STATUTE MILES
141°
141° 30'
142°
QUEENSLAND
AUSTRALIA
The darker shading indicates area seen by the author from the air.
0 50 100 200 300
STATUTE MILES
140° LONGITUDE EAST 145° FROM GREENWICH 150°
5°
10°
15°

Drawn by A. H. Bumstead

A MAP OF NEW GUINEA AND (INSET) A SKETCH OF THE TERRITORY IN WHICH THE AUTHOR MAPPED NEW LAKES AND CHARTED NEW RIVER COURSES

While the chief object of the New Guinea Expedition was to find new varieties of sugar cane, in their seaplane the members saw and were able to chart, by means of aërial photography, a large area, parts of which had never before been visited by white men. The dark-shaded area, comprising the greater portion of the eastern half of the island, is the part covered during the 57 flights by the Expedition's seaplane. New Guinea is the second largest island on earth, Greenland alone exceeding it in area. The western half of the island is a Netherlands possession; the eastern half is divided into two parts—the southern half, the Territory of Papua, is an Australian dependency; the northern half, formerly a German colony, Kaiser Wilhelm's Land, is now administered by Australia under a mandate from the League of Nations. North East New Guinea is the mainland of the mandate; the remainder includes the Bismarck Archipelago (New Britain, New Ireland, and Admiralty Islands) and a portion of the Solomon Islands group. The inset map, showing the Fly River basin, covers 11,000 square miles.

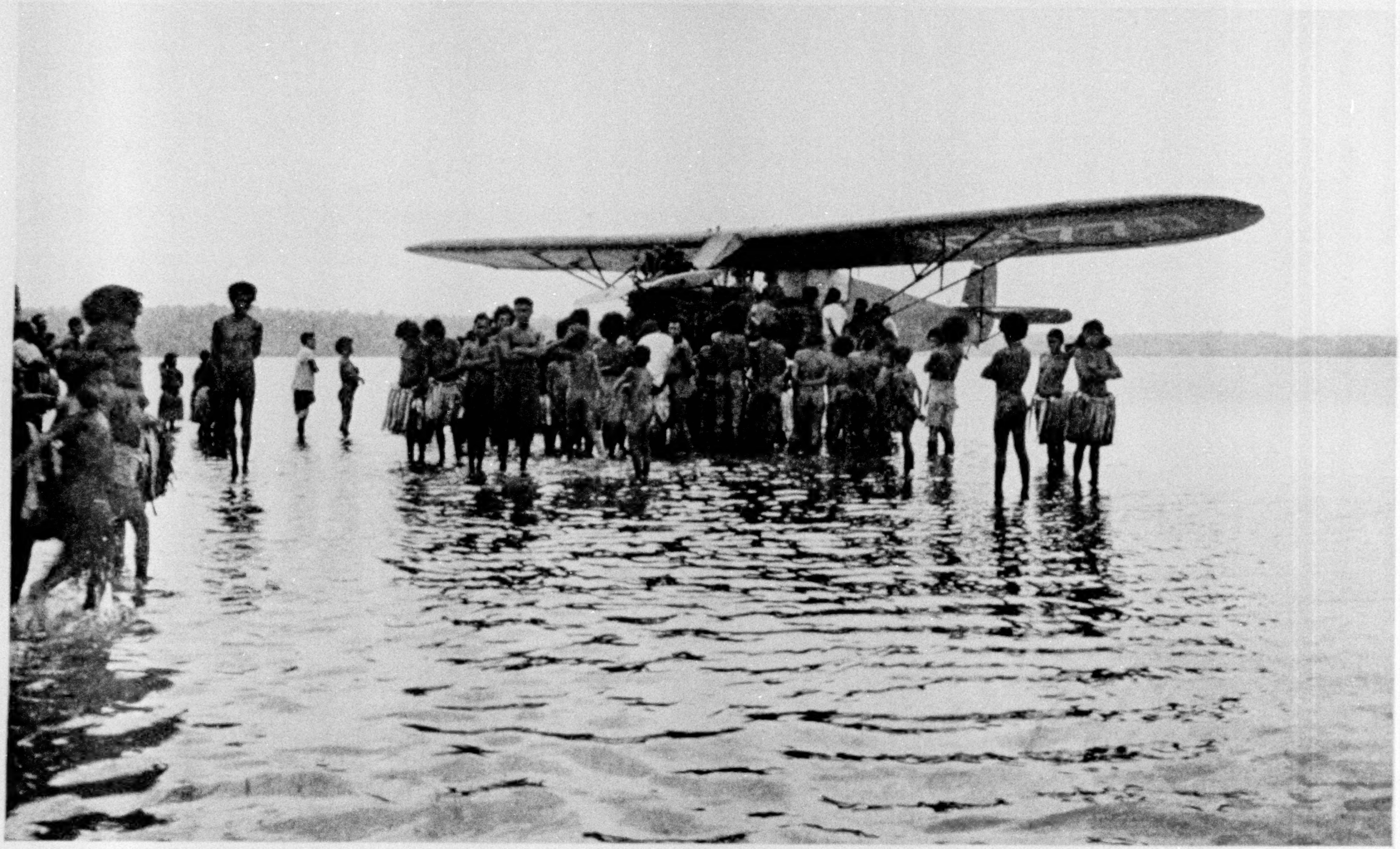
habits reminded us of what our ancestors once were actually like, and of what a long, hard struggle man went through on his magnificent moral climb from savagery up to civilization!

FLYING OVER UNMAPPED NEW GUINEA

Startling it was, also, when now and then we saw these wild men act exactly as we ourselves still act when under the stress of fear or great excitement. In such moments of panic, we had to admit, there is not, after all, such a wide gulf between savage and civilized man.

The world's second largest island, New Guinea is called. Fifteen hundred miles long, it sprawls just below the Equator, in the western Pacific. About its high mountains terrific rainstorms rage, sending its rivers roaring across its vast lowlands in floods of Mississippilike proportions.

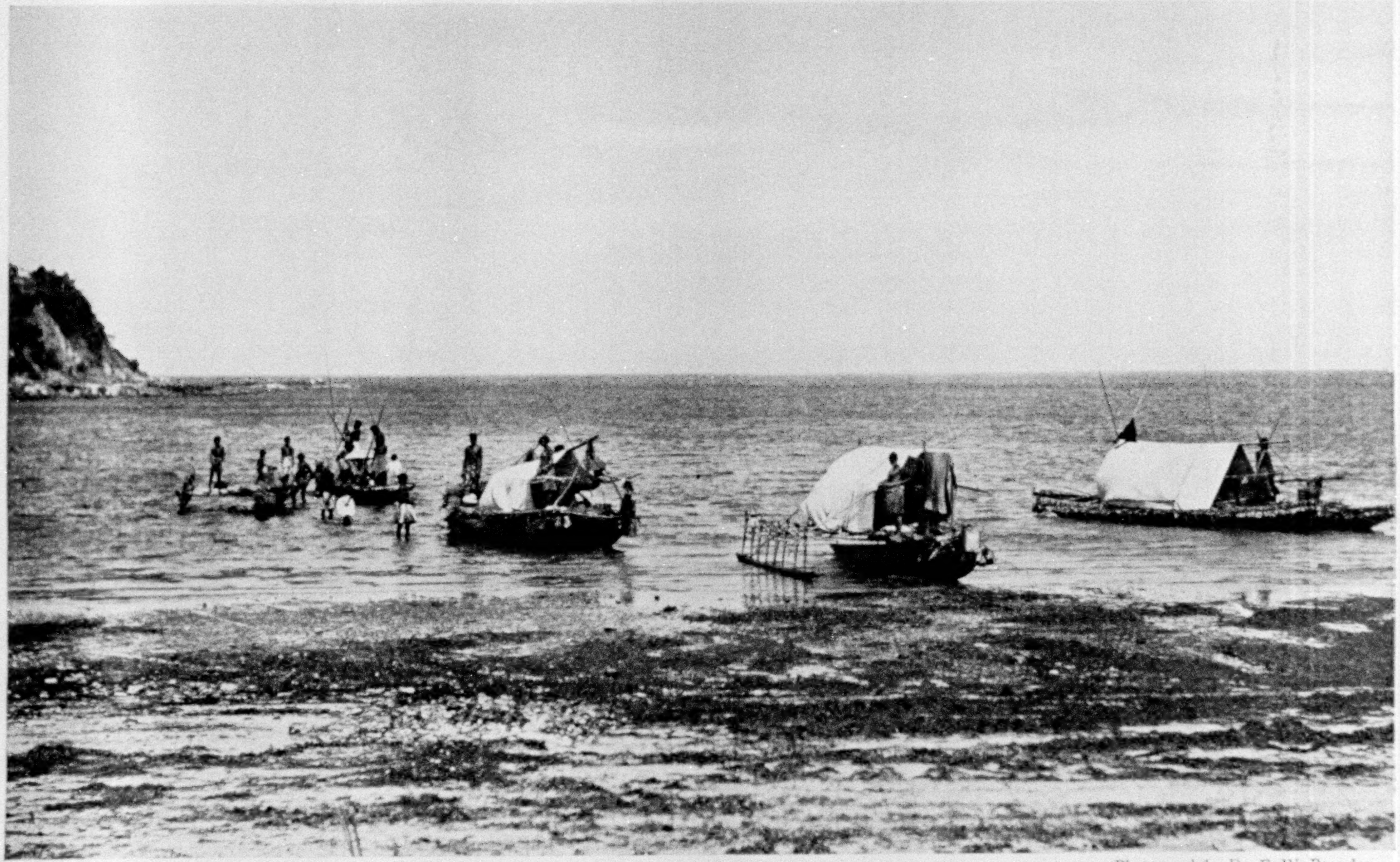
Here and there about the island's rim a



Photograph by R. K. Peck

CURIOUS NATIVES OF HULA WADE OUT TO VIEW THE FLYING MACHINE

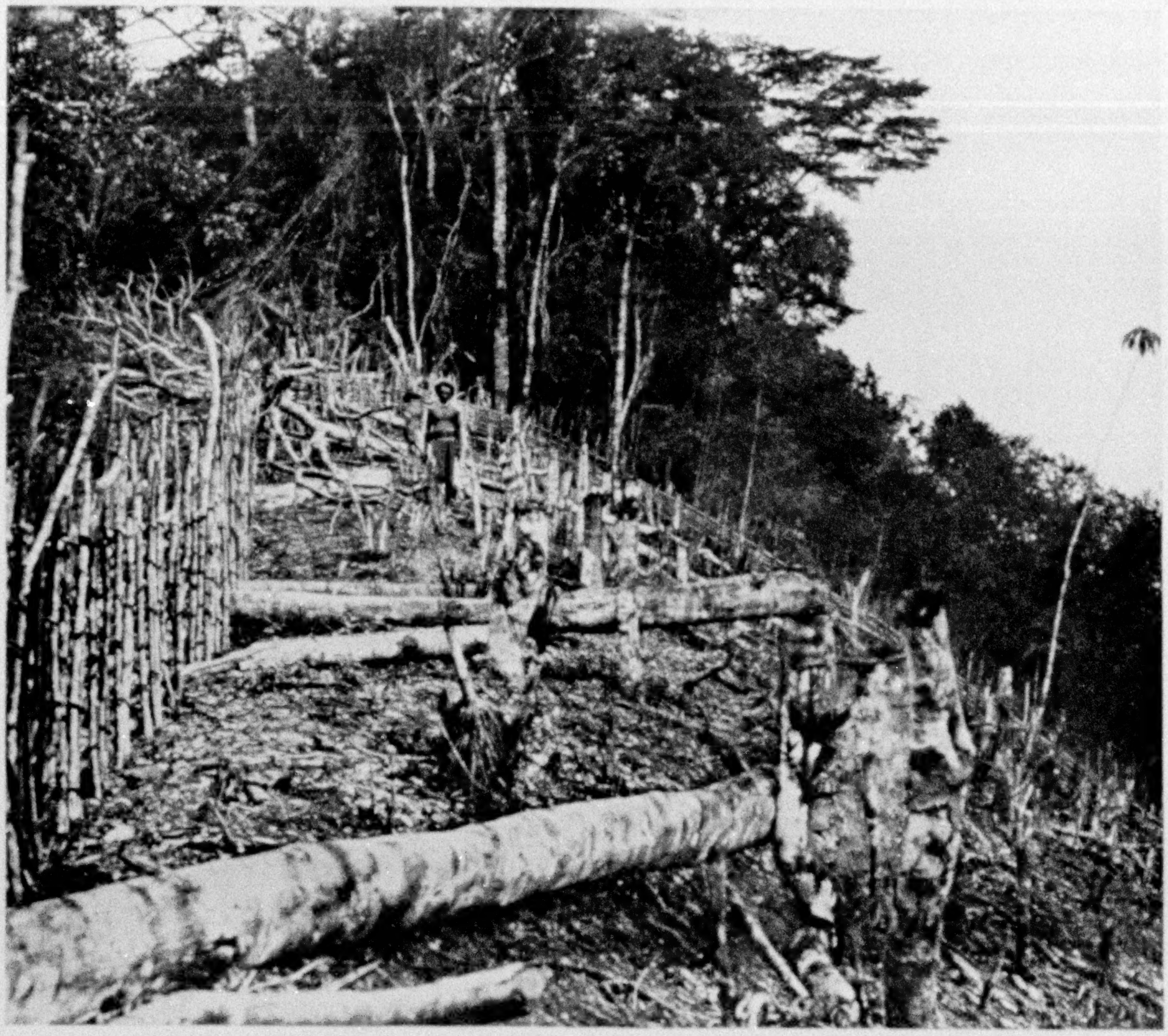
Although these people, living near Port Moresby, long have been in contact with civilization, they made propitiatory offerings of food to the strange monster.



Photograph by Dr. E. W. Brandes

PAPUANS MAKE VOYAGES OF 100 MILES OR MORE IN THESE CRAFT

In their outrigger seagoing canoes (see, also, illustration, page 273) the natives arrive at Port Moresby to trade or "sign on" as laborers.



Photograph by Dr. J. Jeswiet

PREPARING A HILLSIDE FOR A GARDEN

In the mountains back of Rigo these natives are building crude fences or wooden stockades to protect their crops against the raids of bush pigs and wallabies.

few white traders, miners, and planters have gained a foothold. And yet, though it lies hard by the steamer lane from London to Sydney, its dark, evil interior is almost as little known now to the world at large as when daring Pacific explorers—Portuguese, Spanish, Dutch, French, and English—first cruised past its hostile shores centuries ago.

Time and again, in the 57 flights, totaling more than 10,000 miles, which we made over its often unmapped lakes, jungles, and ranges, we realized how much exploring and surveying have yet to be done there before white men can really know all the truth about New Guinea and its less than a million human beings who people this island, which is nearly three times as large as the British Isles. A strange land it is, of coconuts, cannibals, and sorcery; of gorgeous birds of paradise and wattled cassowaries; of mountains, and of swamps alive with crocodiles, carpet snakes, leeches, and mosquitoes.

TO NEW GUINEA IN SEARCH OF SUGAR CANE

It was for the U. S. Department of Agriculture that our small expedition was sent to New Guinea. We went primarily to seek a disease-resisting sugar cane, to revive a sick industry in our own Southern States.

To Canberra, new capital of Australia, we went first, for without the generous aid and coöperation of that commonwealth's officials our exploration in Papua and the mandated Territory of New Guinea could never have been undertaken. Nor shall we ever forget the hearty hos-

Photograph by Dr. J. Jeswiet

SOME OF NEW GUINEA'S PLANTS ARE AS SAVAGE-LOOKING AS THE ISLAND'S HUMAN INHABITANTS

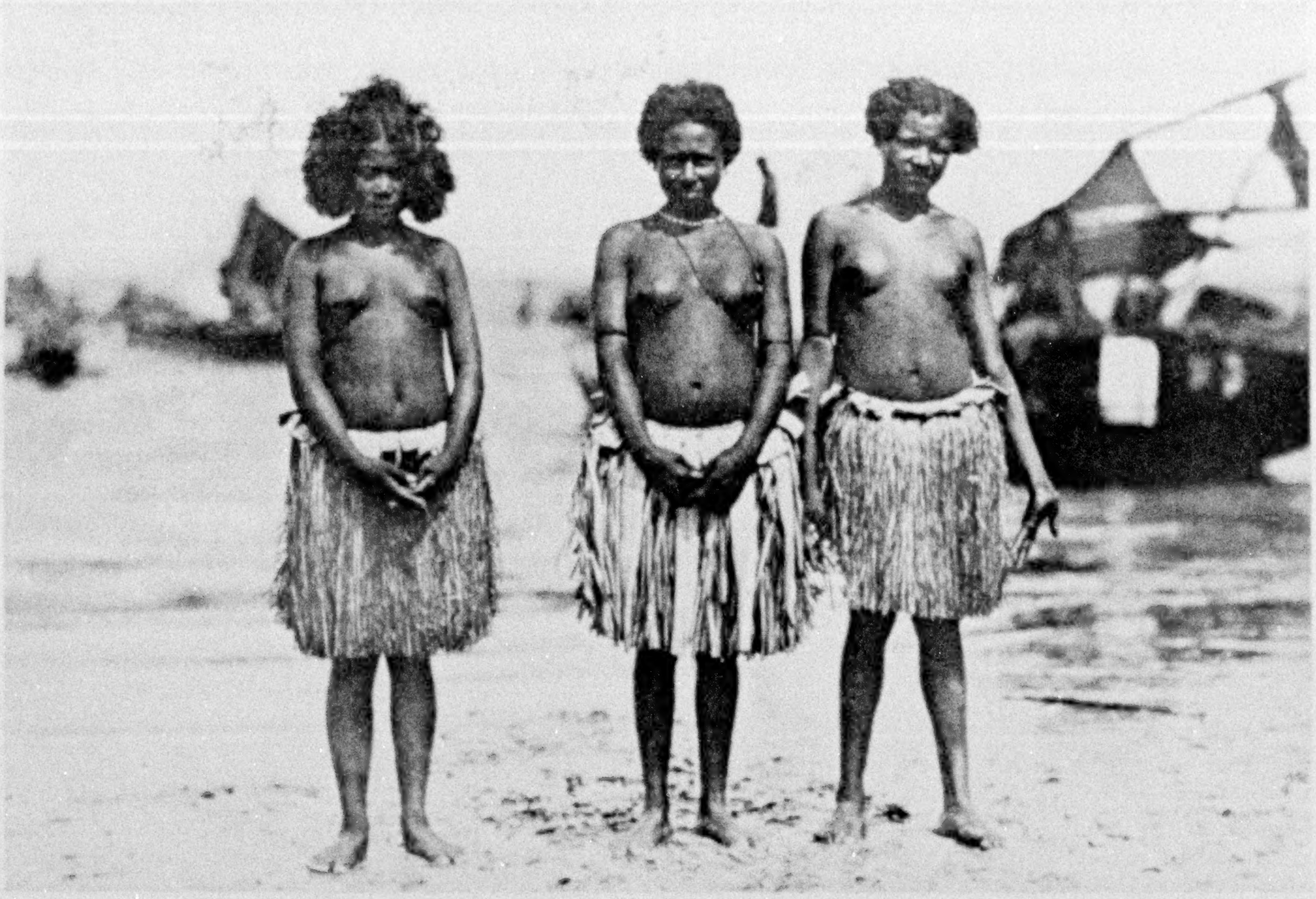
In a swamp a few miles from Port Moresby stands this sago palm, with its odd aërial roots. Here, also, in deeper water, grow water ferns and huge Erythrina trees, whose floating, branched roots are clad with innumerable hairs, apparently for respiration.

pitality and the unselfish assistance extended to us by that patient, courageous group of Australians who are bearing the white man's burden on that vast and rich, but as yet untamed, isle.*

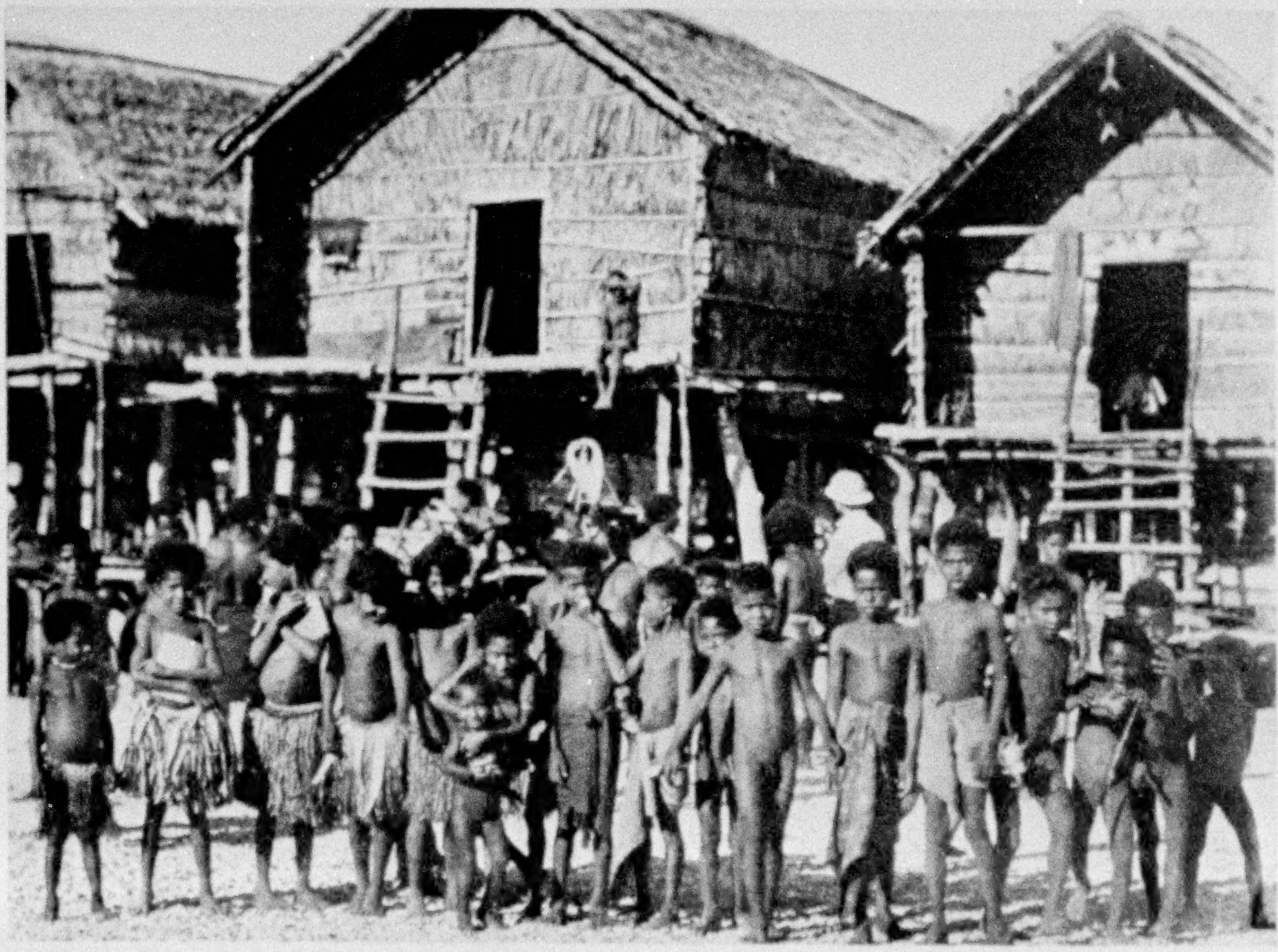
The party included Dr. Jacob Jeswiet, Dutch sugar expert and world authority on the improvement and culture of the sugar-cane plant; Mr. C. E. Pemberton, a seasoned explorer who has spent much of his life seeking in remote places for parasites of sugar-cane insect pests for the Hawaiian Sugar Planters Association; and Mr. Richard K. Peck, airplane pilot, of Elgin, Illinois, a veteran of the Stirling Expedition to Dutch New Guinea in

---

* Among the host of friends, both individuals and institutions, who contributed to the success of our enterprise, Mr. Bror G. Dahlberg, of Chicago, who furnished the seaplane, and the tactful representatives of his company in Australia, whose assistance in securing an official hearing for our enterprise was indispensable, played leading rôles. To the officials of the Colonial Sugar Refining Company of Sydney, who cared for our collection of cane varieties, a duplicate set of which was planted at Sydney, grateful acknowledgment is due. The Australian Prime Minister, the Right Hon. Stanley Melbourne Bruce; the Lieutenant Governor of Papua, Sir J. H. P. Murray; the Acting Administrator of Papua, the Hon. Staniforth Smith; the Administrator of the Territory of New Guinea, Brig.-Gen. E. A. Wisdom, and, last but not least, Australia's war-time Prime Minister, Mr. "Billy" Hughes, all extended courtesies and essential aid far beyond what we could reasonably have hoped for.



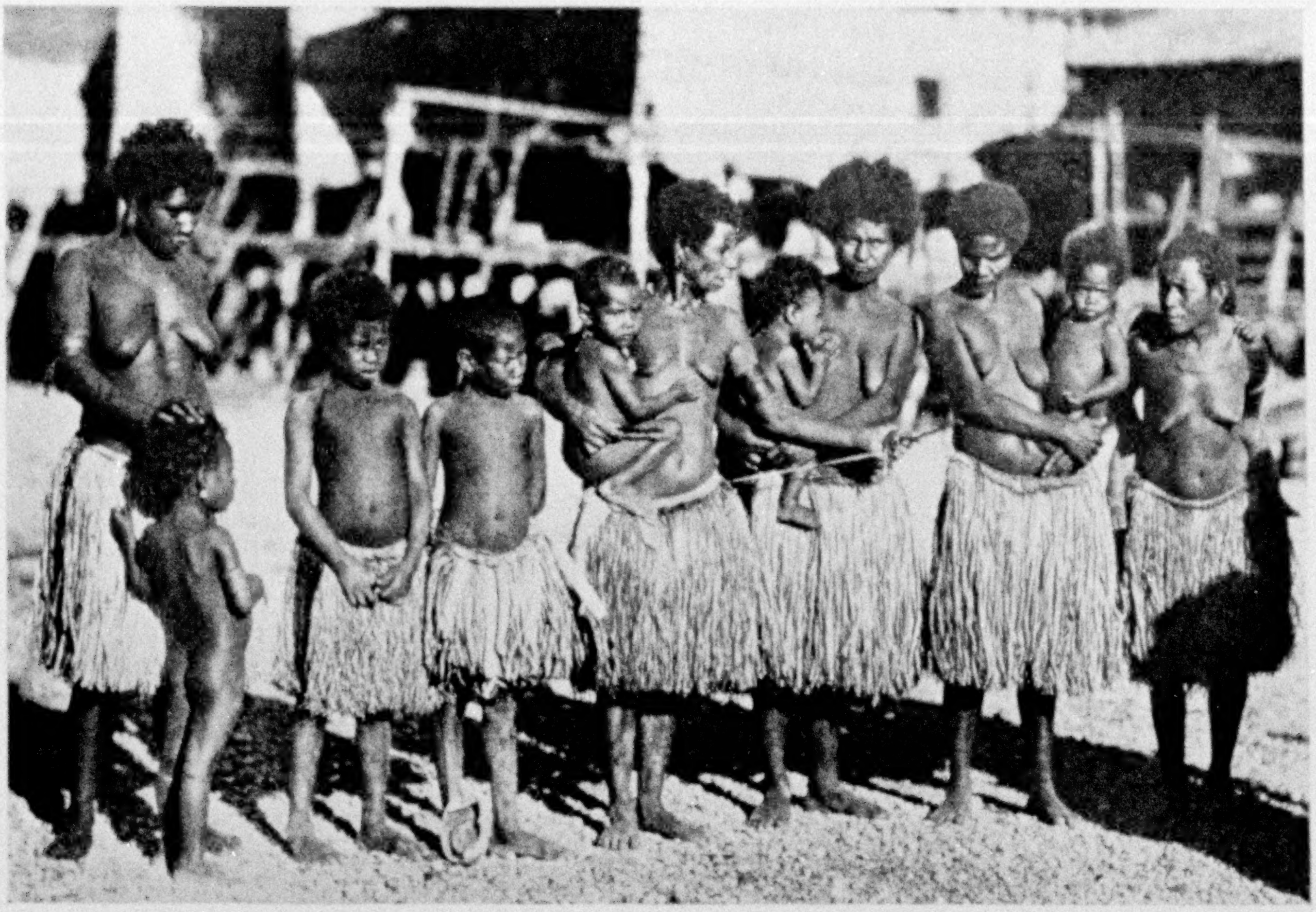
THREE ALERT WOMEN FROM THE VILLAGE OF HULA (SEE PAGES 254, 256, AND 272)



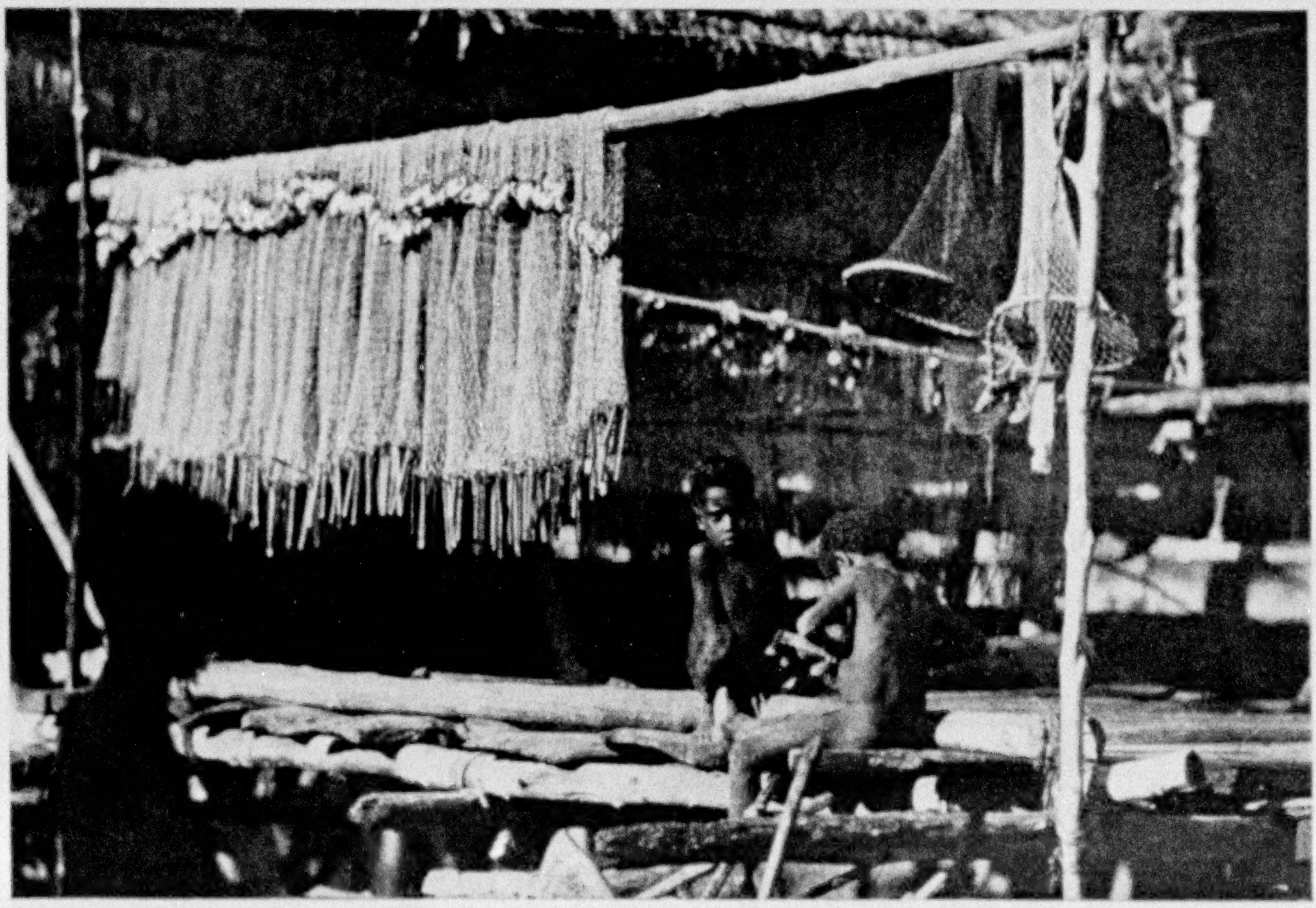
Photographs by Dr. E. W. Brandes

NEAR WHITE SETTLEMENTS, SCHOOLS FOR NATIVES HAVE BEEN ESTABLISHED

Among these mission pupils at Elevala (see pages 265 and 277), two are seen with books. Many native children speak fair English and play cricket and football with much enthusiasm.



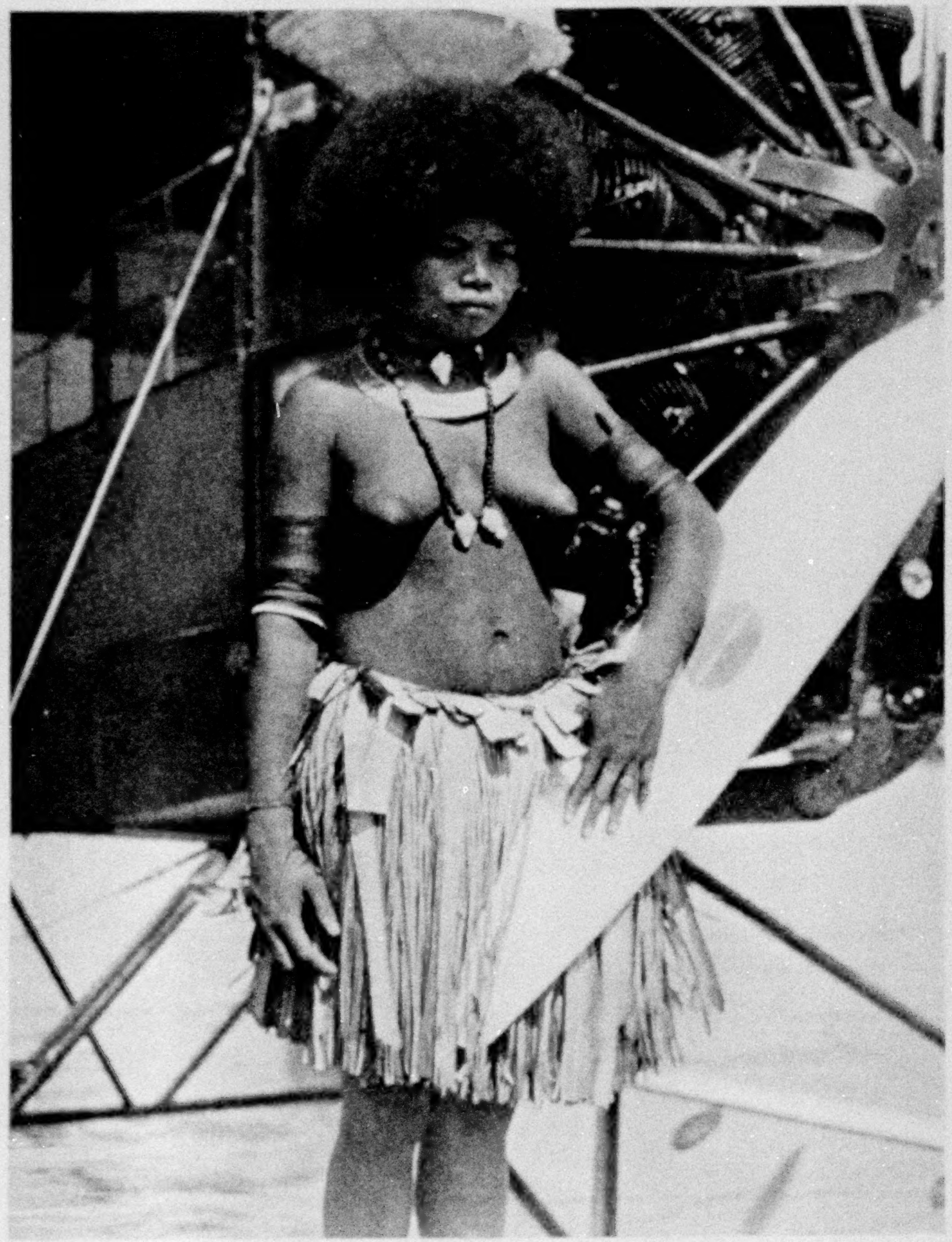
SMALL FAMILIES ARE THE RULE IN PAPUA; MATRONS OF ELEVALA AND THEIR BABIES



Photographs by Dr. E. W. Brandes

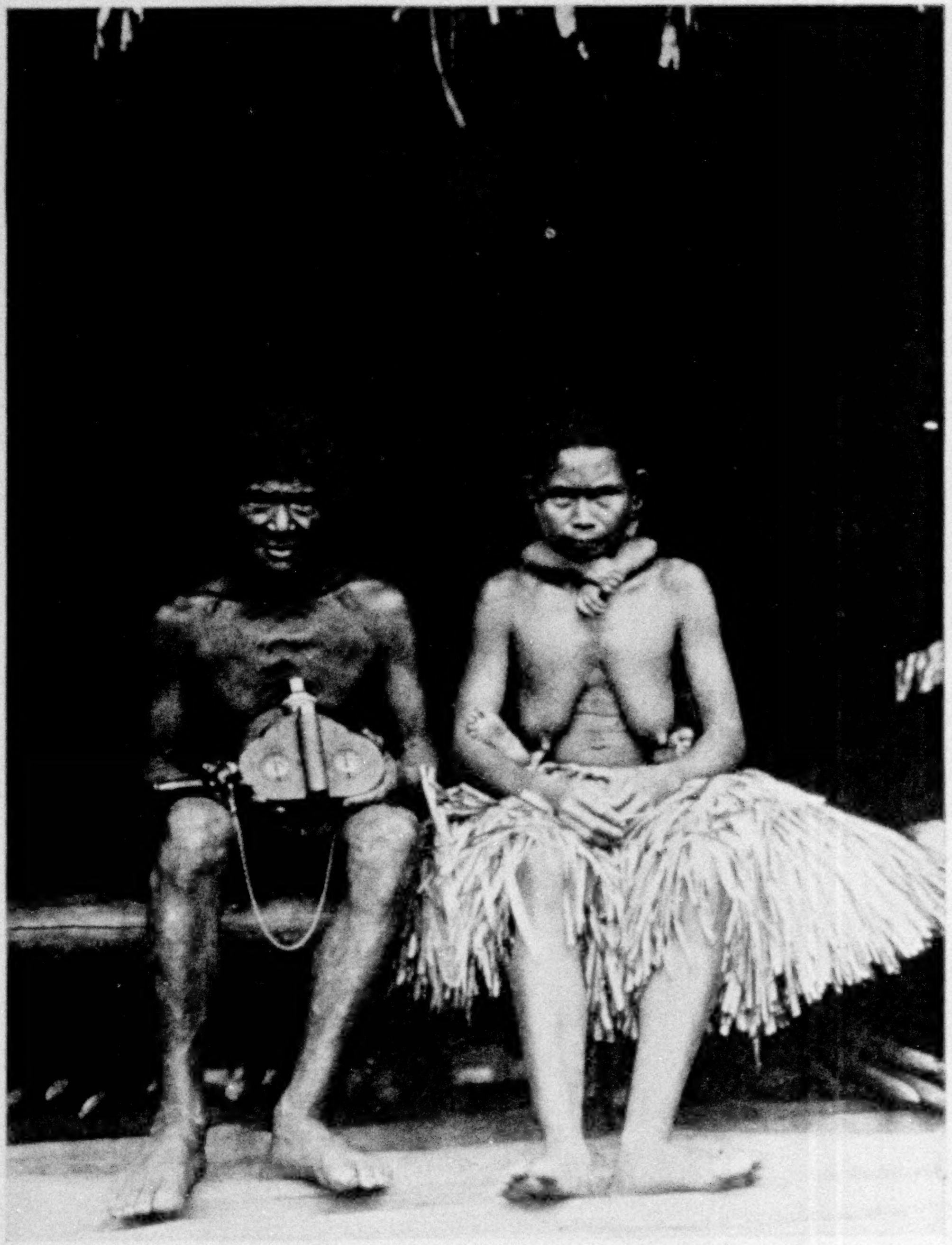
FISH NETS USED BY PORT MORESBY NATIVES

All coastal natives of New Guinea are expert fishermen. Remote as they are from civilization, they make nets similar to those used in other seas (see, also, text, page 272).



AVIATION INTERESTS WOMANKIND EVEN IN NEW GUINEA

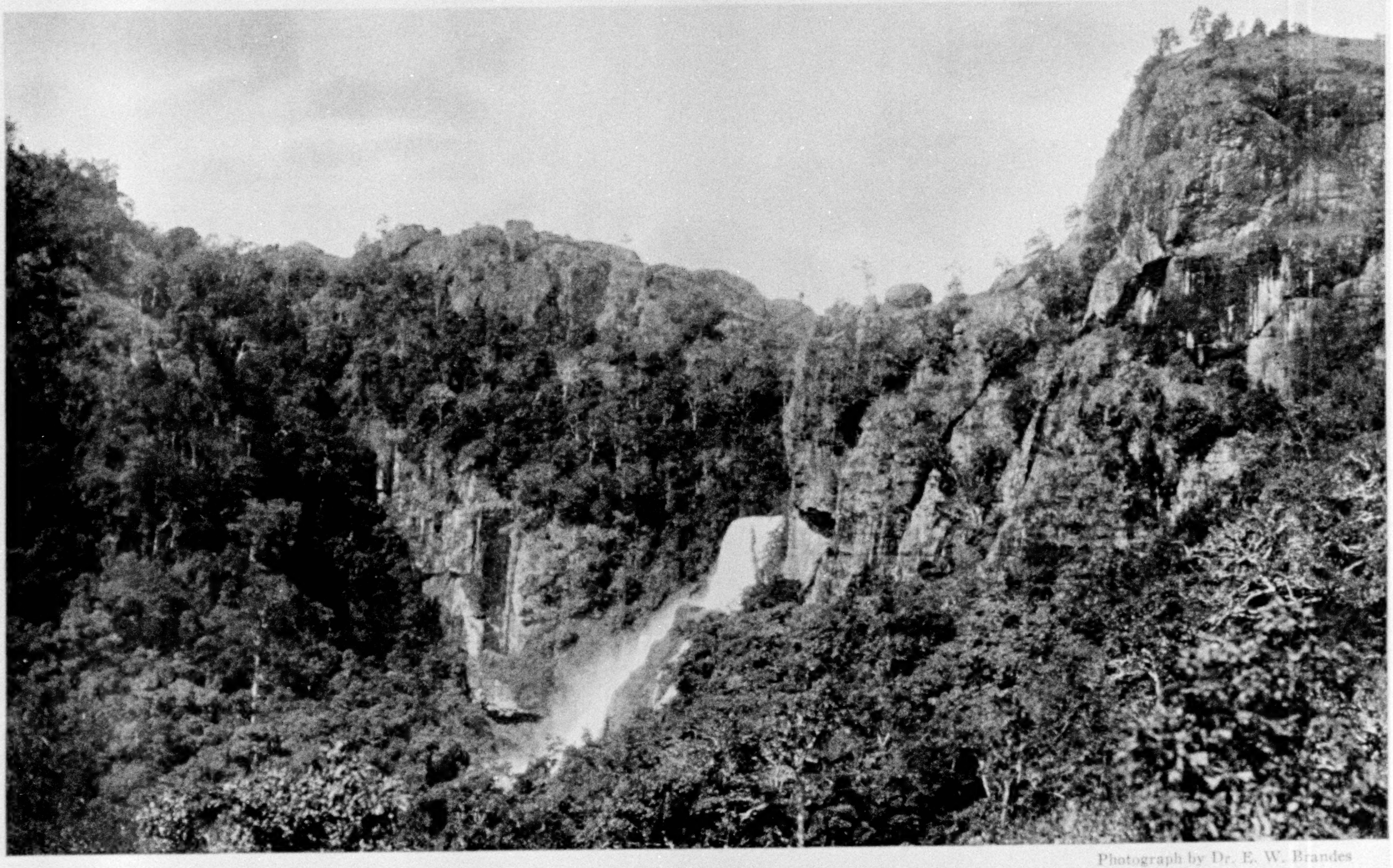
This robust young Melanesian woman from the village of Hula (see, also, pages 254 and 256), with her huge mop of frizzly hair, is of the type found along the southeast coast of the island.



Photographs by R. K. Peck

MAN AND WIFE POSE FOR THEIR PICTURE

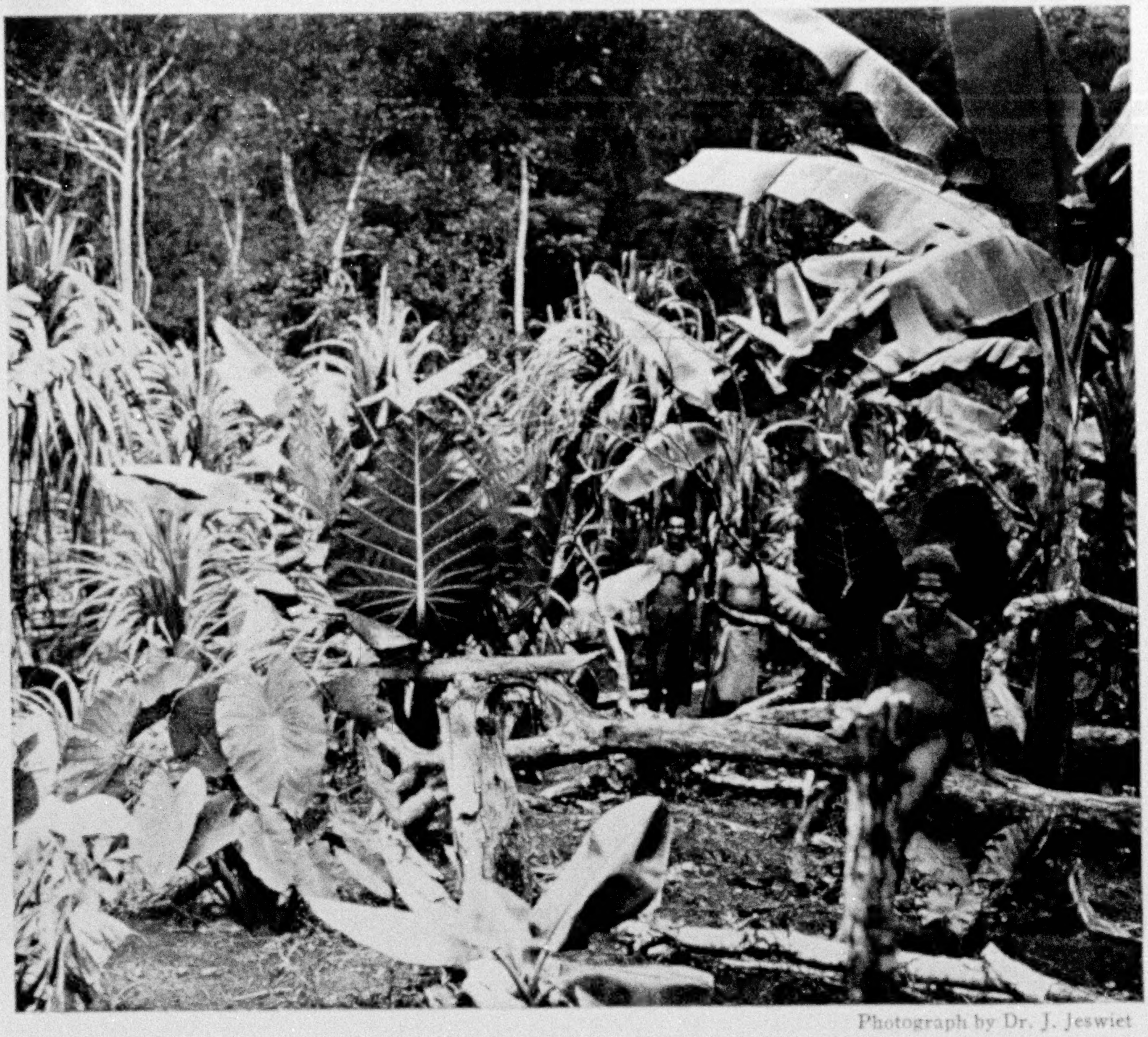
He was fascinated by the whir of the motion-picture camera and wanted to examine its machinery. Clasped about the woman's neck are the arms of her infant. The family lives near Port Moresby.



Photograph by Dr. E. W. Brandes

TWENTY MILES FROM PORT MORESBY, OVER THE ONLY STRETCH OF IMPROVED ROAD IN ALL PAPUA, THE TRAVELER REACHES RONA FALLS

The main leap of this impressive cataract of the Laloki River is from 80 to 90 feet. While its hydroelectric possibilities are considerable, there is no prospect of its early development, for the largest city in Papua, Port Moresby, has only 300 white inhabitants.



Photograph by Dr. J. Jeswiet

DESPITE CRUDE IMPLEMENTS, PAPUANS CULTIVATE MANY PLANTS

In a forest clearing near Rigo grows this garden, in which are grouped, in disorderly fashion, taro, cane, yams, and bananas (see, also, text, page 271).

1925-26, to whose skill and judgment we owe much of the success of the Expedition.

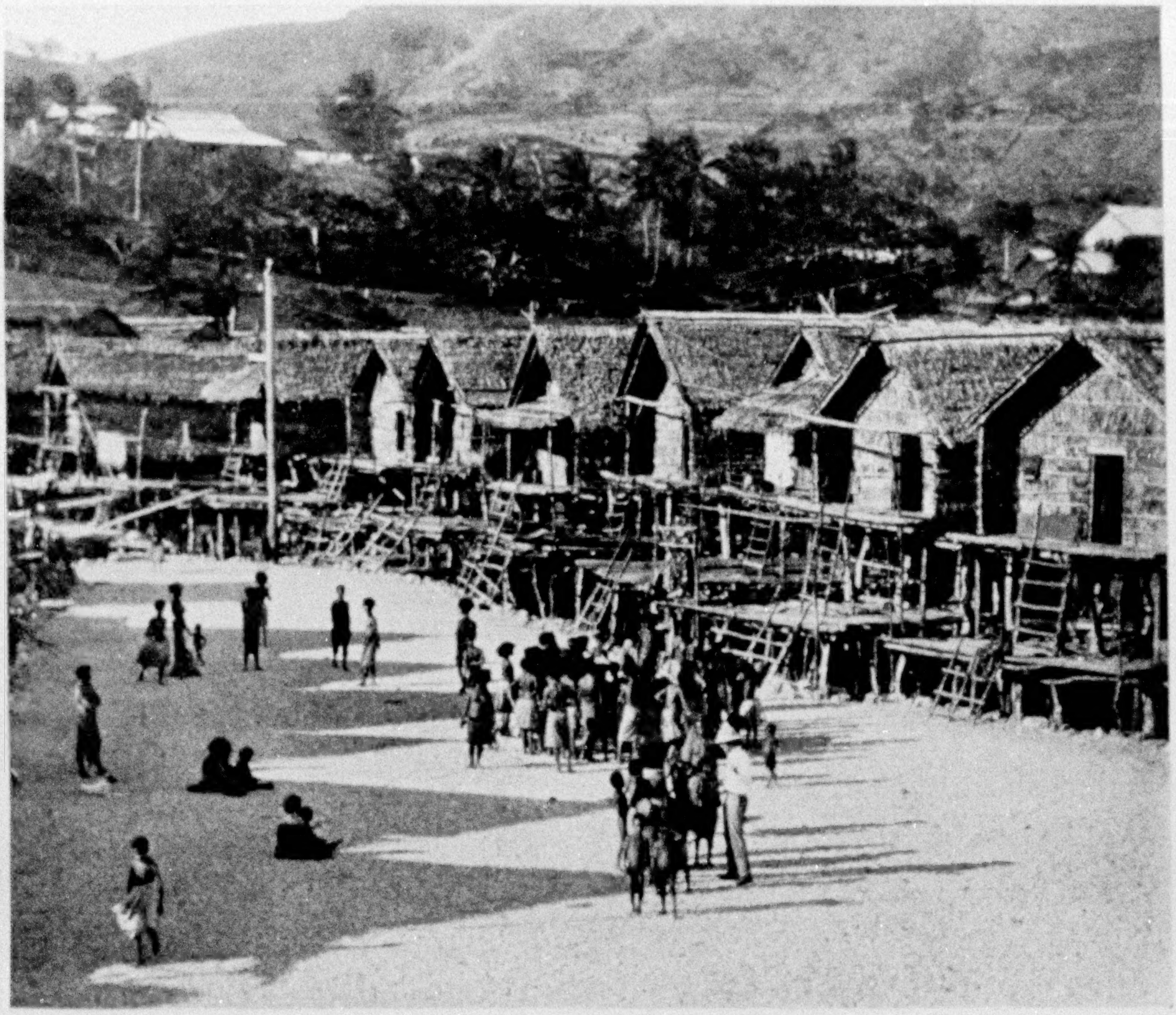
THE FIRST FLIGHT

To Samarai, a tiny island off the southeast tip of New Guinea (see map, page 255), we shipped our seaplane when full official sanction of our agricultural adventure was granted; and it was from Samarai, our plane duly lowered to the sea and fueled, that our first flight of inspection to Port Moresby, our main base of supply, was made. Cheered by a farewell toot from the steamship *Montoro*, Peck and I took the air and headed for "Port," as the island's biggest white colony is called.

The 260-mile flight along the southern coast from Samarai to Port Moresby hinted at the scenery we were to enjoy for the next three months—an amazing panorama of submerged coral reefs, palm-fringed beaches, and wooded hills, terminating far inland in majestic peaks mantled in swirling mists.

Birds floated lazily among tree tops, and in the clear blue waters sharks could be seen stealthily nosing their way among the reefs. Native villages nestled on promontories, with well-beaten pathways meandering back to garden patches cleared in the jungle.

Now and then we saw geometric plantings of coconuts over wide coastal areas, each with its neat plantation house of European design and its own private sailing vessel anchored in a sheltered cove adjacent to it. We descended for a close look at a platformed seagoing double ca-



Photograph by Dr. E. W. Brandes

NIPA SHACKS AT ELEVALA (SEE, ALSO, PAGES 260 AND 277)

noe with "crab claw" sails, much to the alarm of its native crew, who frantically tried to get away.

This shore line east of Port Moresby is cut by deep bays, safe refuge for small craft. We passed broad, black mangrove swamps crossed by serpentine rivers pouring chocolate-colored water into the blue Pacific. On our maps many of these rivers were shown much straightened out, free of the oxbows, bends, and kinks which they actually achieve, as seen from the air. Often, too, these rivers abandon their beds and take new courses.

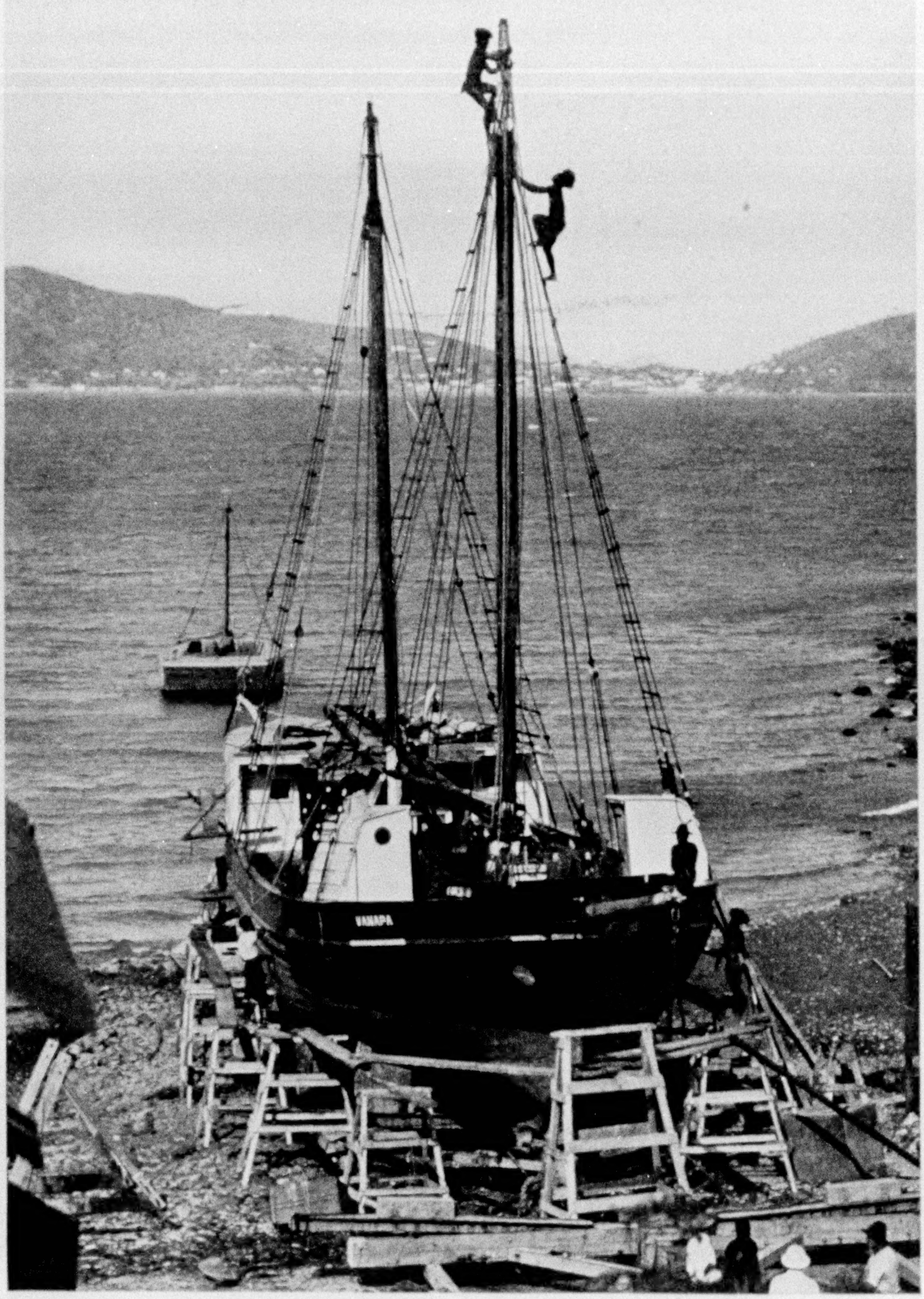
VILLAGES BUILT ON STILTS OVER WATER

Nearing Port Moresby, we saw villages that were built over the sea—brown-thatched houses poised like spindle-legged "water striders" upon the waves (see illustrations, pages 277 and 279). Originally designed for protection of maritime villagers against bloodthirsty hill tribes, this style of city planning is now encouraged by the Government for sanitary reasons. To each house is tethered its dugout canoe, apparently still ready for any emergency.

The parched hills about Port Moresby came now into view. Soon we raised the clean-looking town between two hills of an elevated peninsula that almost completely locks the harbor from southeast trade winds. The peak of the landward hill is capped with a large field of corrugated sheet metal, the contour of which is designed to catch and direct rainwater into a large, covered, concrete reservoir, which provides water for use when the ordinary roof tanks go dry.

Port Moresby had a population of about 300 whites during our sojourn. Most men are in Government service or trade.

Its chief exports are copra, rubber, copper, gold, bêche de mer, or trepang (a sea



Photograph by Dr. E. W. Brandes

THE "VANAPA," SUPPLY SHIP OF THE EXPEDITION, BEING OVERHAULED OPPOSITE PORT MORESBY

Some of the coast men of New Guinea make good sailors. Here the *Vanapa's* mop-headed crew is calking, painting, and overhauling gear, making the vessel ready for its first cruise up the Strickland River (see text, opposite page).

Photograph by Dr. E. W. Brandes

PILOT PECK, MR. IVAN CHAMPION, A PAPUAN GOVERNMENT OFFICIAL, AND AN AMERICAN WOMAN ARTIST

Much to the surprise of the members of the cane-hunting expedition, a young American artist and her companion suddenly appeared aboard the supply boat *Vanapa* after it had left Port Moresby. The two women accompanied the party up the Fly River as far as Everill Junction and remained at the base camp two days. They were jokingly referred to as "stowaways" by the members of the Expedition, but they had paid the captain of the ship passage money for their adventurous voyage (see text, page 285).

slug exported to China, where it is esteemed a delicacy in making soups), pearls, and trochus shell. Luggers engaged in the pearling industry are licensed at Daru, but as the Queensland boundary extends in these waters to within a few miles of the Papuan coast, most of the pearls and pearl shell obtained by them are not credited to the Territory of Papua.

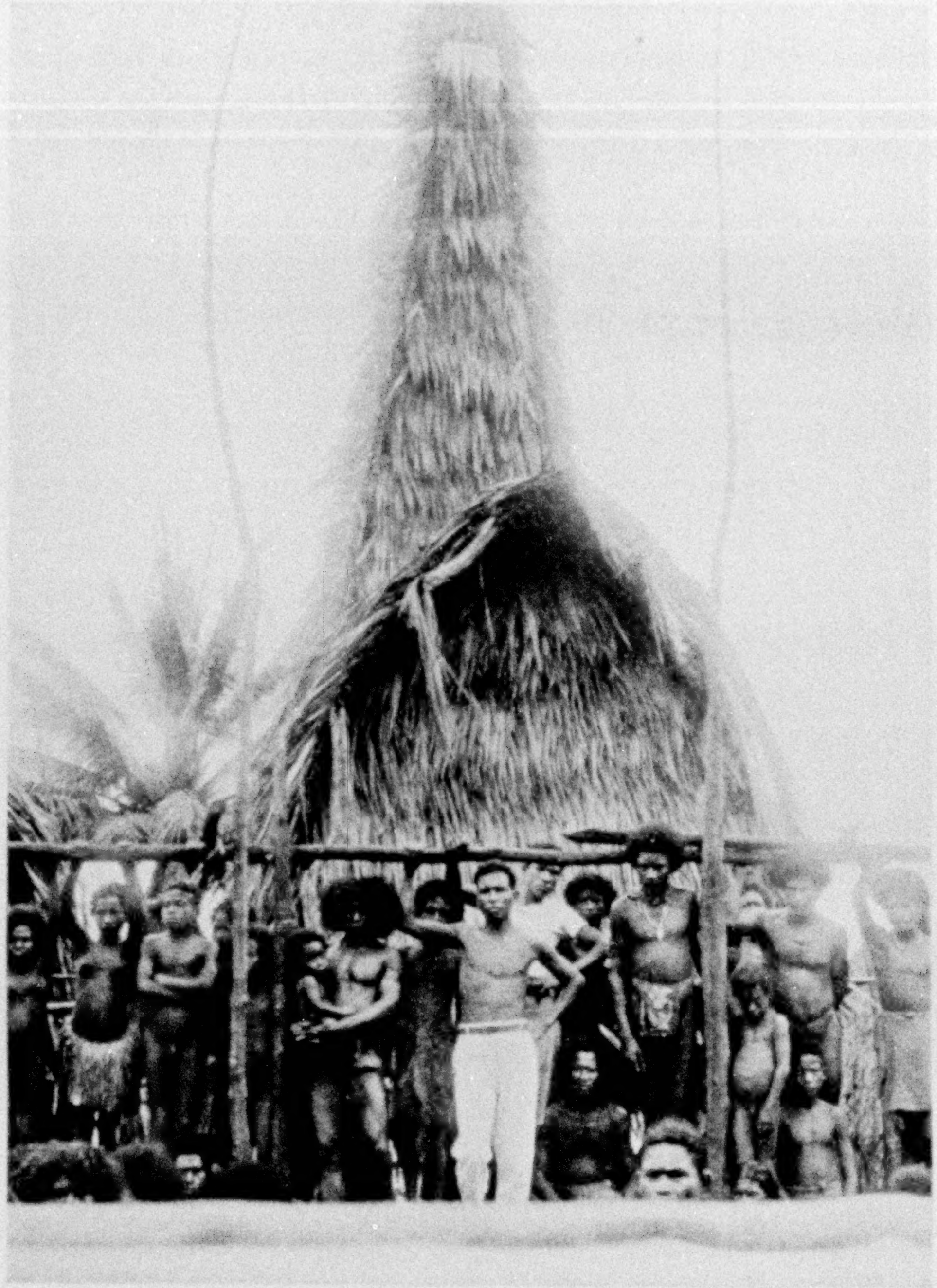
OUTFITTING AT PORT MORESBY

We spent the ten days in Port outfitting and supplementing stores shipped from Australia and America. We chartered an auxiliary ketch, the *Vanapa*, of about 100 tons burden, to transport most of our men, our fuel, supplies, and scientific instruments to some yet-to-be-found point on the Strickland River, which would later become our first base camp. In general, we had decided on the left bank of the Strickland River, above its juncture with the Fly, in a mysterious region regarded by coast folk with superstitious awe.

Those on board included Ivan Champion, now Assistant Resident Magistrate, and a detachment of native police, detailed by the Government to guard us.

Camp making and direction of transport was in the hands of a wandering son of California, Mr. Roy Bannon, who reached this far strand years ago. In his charge were the signed-on "boys," including Gano, the cook; Euki, a reputed wash-wash boy; Emere, a slight, furtive individual, chosen, because of his lack of weight, as "crew of airplane"; and Nape, my personal boy, truculent, but a straight, well-muscled fellow, clever with bow and arrow.

On board, also, were 1,150 gallons of aviation gasoline in 10-gallon drums, tons of tinned food and rice, 3 portable boats with outboard motors, 6 wall tents and 30 tent flies, and the usual complement of



Photograph by R. K. Peck

THIS TEMPORARY THATCHED "STEEPLE" CELEBRATES THE BUILDING OF A NEW HOUSE

A Hula "town boy," in white trousers and with civilized haircut, stands in the foreground.

cots, blankets, fine-mesh sleeping nets, arms, ammunition, hospital goods, and an assortment of scientific supplies, including still and motion-picture cameras.

To the accompaniment of somewhat blasphemous observations by the skipper, the *Vanapa's* sputtering motor finally sensed its master's voice and started. In a downpour of rain the little vessel nosed out through the inlet into a half gale and disappeared from our view.

WE EXPLORE THE DELTA DIVISION

With our other scientists, I remained in Port Moresby, utilizing the three weeks required by the *Vanapa* to reach our base camp to make air trips to various rivers on the south coast.

These first trips were all made from Port Moresby as a base, and we did not fly more than 250 to 300 miles away from Port in a direct line, nor did we remain out more than three days, on account of the limited food supply that could be carried.

One visit was made to Kikori, the Government station of the Delta Division. It stands on the Kikori River, about 30 miles inland. This coast country for more than 100 miles is low and flat. For the most part it consists of innumerable river deltas. Large areas are covered by mangrove and sago palm swamps.

Sago is the staff of life for natives who dwell in the tidal marshes, in houses standing on piles above the morass. Generally the villages are situated on the banks of sluggish streams.

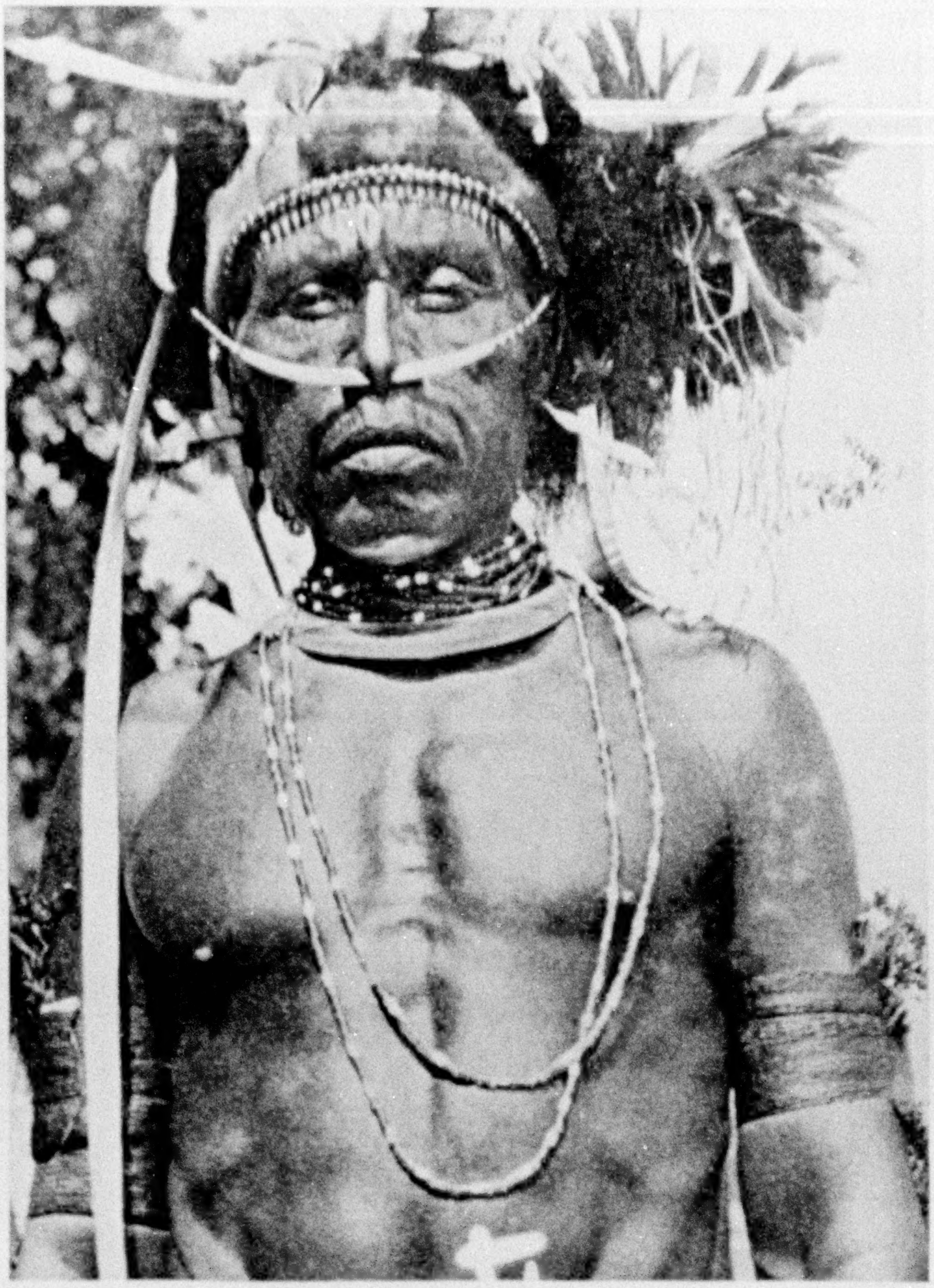
The houses themselves are "distinctive," to borrow from a Western salesman's vocabulary, having a huge, gaping entrance extending from floor to ridgepole. The men's "clubhouses" may be several hundred feet long, low at the rear, but rising to an overhanging peak 50 or 60 feet high in front; their resemblance to a snake with wide-open jaws is remarkable.

The social arrangements and material culture in this part of Papua are interesting.

Although promiscuous mating still occurs during the observance of certain ceremonies, in which many villages may participate, marriage is old among these Delta people and is the basis of family and clan life. Parents may make marriage plans for their children, but these juvenile betrothals are apparently tentative, pending the decision of the children themselves when they attain years of discretion.

LACK OF WOMEN PREVENTS PRACTICE OF POLYGAMY

In case the marriage does not take place, any payments of ornaments or other articles made by the boy's parents are returned by the family of the girl. No feasting or other ceremony is observed at a marriage. The price paid for the bride is not ruinous—just a few arm shells or other ornaments, a pig or a dog. A bride may leave her husband, but then all payments must be returned. While the affair may appear quite mercenary, it is observed that a certain degree of consideration is given to the inclination and wishes of the girl, both before and after marriage.


Photograph by Alfred Gibson

HE DRIVES A BUS IN PORT MORESBY

His nose ornament, made from a big clamshell, is worn only in ceremonials—not while he is pursuing his occupation of chauffeur.

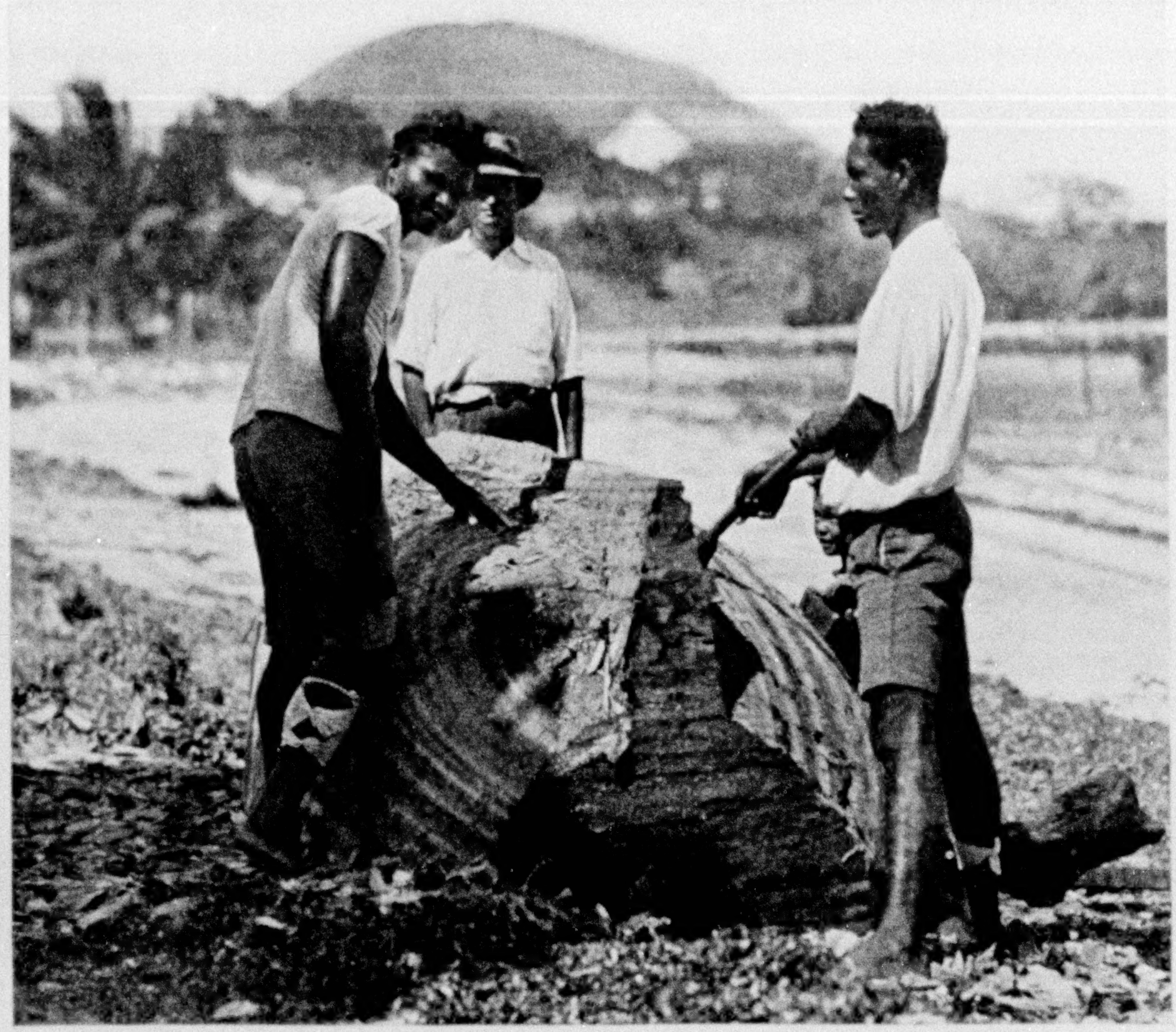
The only deterrent to polygamy is the lack of women, which in parts of New Guinea is due to female infanticide. As it is, about one-fourth of the married men in this area have more than one wife and some have a half dozen or more.

This results in a fairly large proportion of young bachelors, who dwell in the *ravi,* or men's clubhouse. The married men also repair to the ravi at intervals, for the sake of a little peace and quiet or to participate in feasts.

The medium of exchange in this part of the island is the arm shell, a section of the shell of a sea snail, cut and finished so that it forms an armlet or bracelet two or three inches wide. Other durable ornaments are also used, such as dog and wallaby teeth and disks or rings cut from pearl shell; but usually commodities are bartered directly.

CLOTHING IS NEGLIGIBLE OR NON-EXISTENT

Dress is a simple matter. Boys up to about ten and girls up to six wear nothing. A man wears a small band of tapa cloth; one end hangs as an apron. Women's



Photograph by Dr. E. W. Brandes

CARPENTERS SKILLFULLY SHAPE A DINGHY FROM A LOG, ON THE BEACH NEAR PORT MORESBY

The inside of the boat is not burned out, but laboriously chipped away.

dress consists of a band of strawlike material made by shredding sago leaves. It is held in place by a fiber string or bark belt around the waist, and the two loose ends are tucked up under the belt at the rear and project backward like a tail. Very old men go naked.

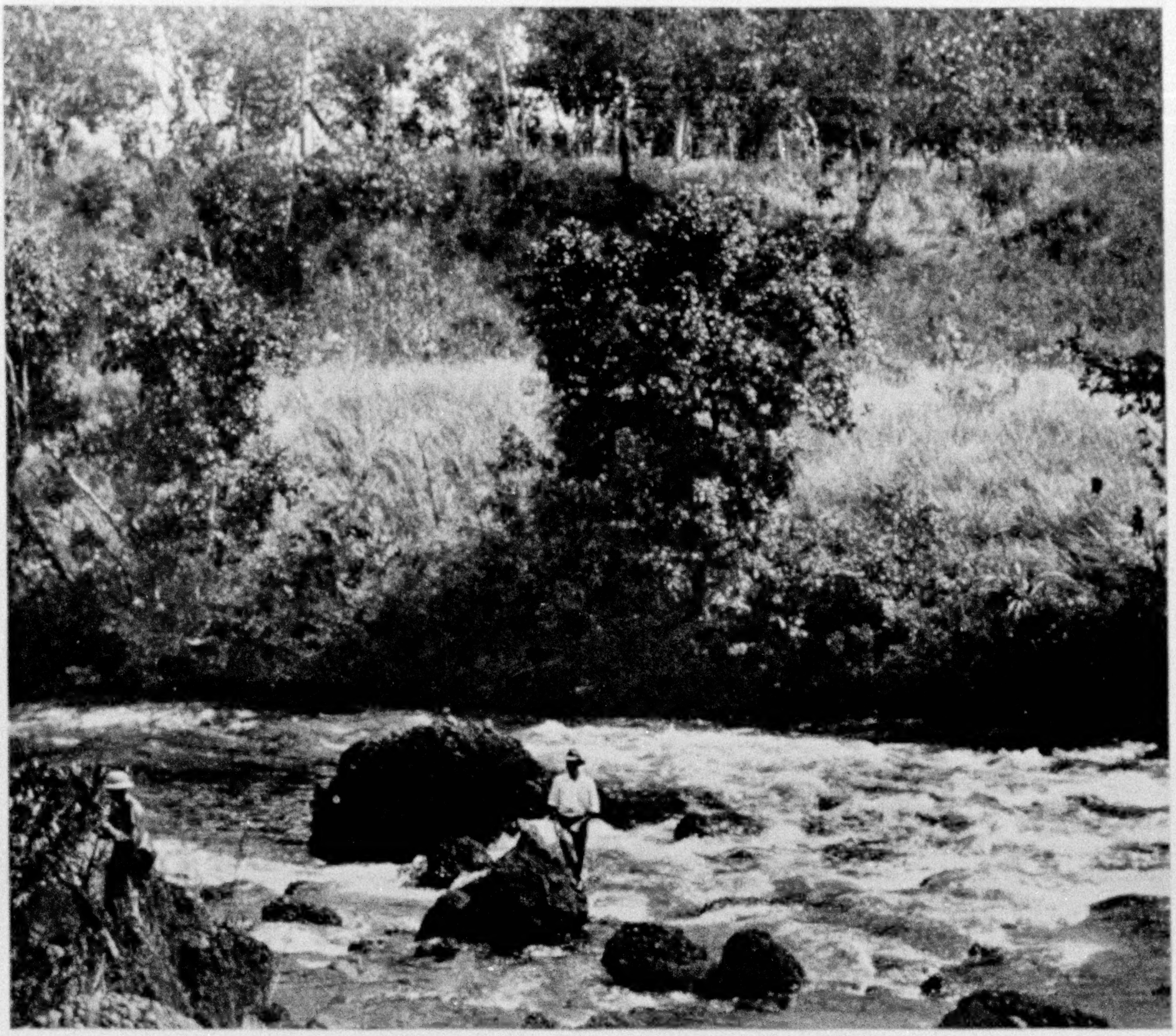
A MARRIED WOMAN SHAVES HER HEAD

Men and women have the nasal septum and ear lobes pierced, and wear in the former elongated, pencil-shaped ornaments made of the white shell of the giant clam, and in the latter rolls of palm leaf, loops of cassowary quills, or selections from an assortment of other bone and shell jewelry. Women commonly have a series of V-shaped scars, like chevrons, on the leg, upper arm, or breast. Although the natives were questioned, we were unable to discover any significance for these marks.

Men are clean shaven except when in mourning or when old. Shaving is painful. It is done by looping a fiber about each hair and jerking it out. The barber's patron lies on his back and the barber sits on the sufferer's chest. Beards may be decorated with lumps of mud or other ornaments.

Until she marries, a girl wears her hair long. Matrons shave it off completely or bob it to about one inch in length. Sometimes small patches or tufts remain, in more or less geometric designs, and shell disks are tied to these, being fastened close to the head like "curl papers."

The Delta people are sago eaters, and the slow-growing palms may be private property, having been planted by the



Photograph by Dr. E. W. Brandes

THE SWIFT-RUNNING LALOKI RIVER (SEE, ALSO, PAGE 263)

Near here is one of the two operating rubber plantations in Papua. This site was selected as a propagating garden or intermediate depot for the Expedition's cane collection, which, to be kept alive, had to make the journey to America in relays.

owner's father, or they may be wild trees growing in the swamps remote from the village. When sago is required, the man will go to the tree selected, cut it down, and float the trunk to the village, the fabrication of the starch being turned over to the women.

Sago is supplemented by other products of the swamps and jungle, and a rude horticulture is carried on in clearings where the land is a little more elevated. The trees are cut down with trade axes and suffered to lie where they fall, the limbs being trimmed off and dragged away. Planting is done by thrusting a pointed stick of black palm into the ground and moving the free end back and forth to widen the hole. Joints of sugar cane, banana "bulbs" and cormels of taro are planted at random among fallen trees. Tobacco, manihot, coconuts, sweet potato, and breadfruit also grow here. Weeding is accomplished by tearing out the undesired growths by hand or with a trade knife, but the weeds sooner or later are responsible for abandonment of the garden. Apparently the native prefers to clear a new patch rather than face the drudgery of eternally fighting the weeds. In general only two successive plantings are made in a clearing, after which it is quickly reclaimed by the jungle.

A CANOE IS THE HUNTER'S OUIJA BOARD

Variety of food is provided by hunting and fishing. The native always carries his bow and arrows in his canoe or when walking in the woods, on the chance of

Photograph by Dr. E. W. Brandes

A HULA MAID SMILES INTO THE AUTHOR'S LENS

encountering a bush pig (see page 303) or cassowary (see page 326). The pig is a dangerous beast when wounded and the cassowary is no mean adversary; so hunting parties of a dozen or twenty men are preferred for protection and to increase the chance of returning with game.

A record of kills in hunting is often kept. In front of a house on the Kikori River I saw a device resembling a xylophone, made of tubes of bamboo of unequal diameter; this, it developed later, was the owner's wild-boar score.

Fishing is done by women as well as men. Girls may be seen wading about in the small streams, each provided with two conical traps held by the apical ends. These they thrust down at intervals, attempting to ensnare shrimp or fish. Such traps are shaped like canary or parrot cages and are made from strips of sago leaf. Nets, seines, and hand lines of various kinds are also used in the rivers and on the beach (see page 261).

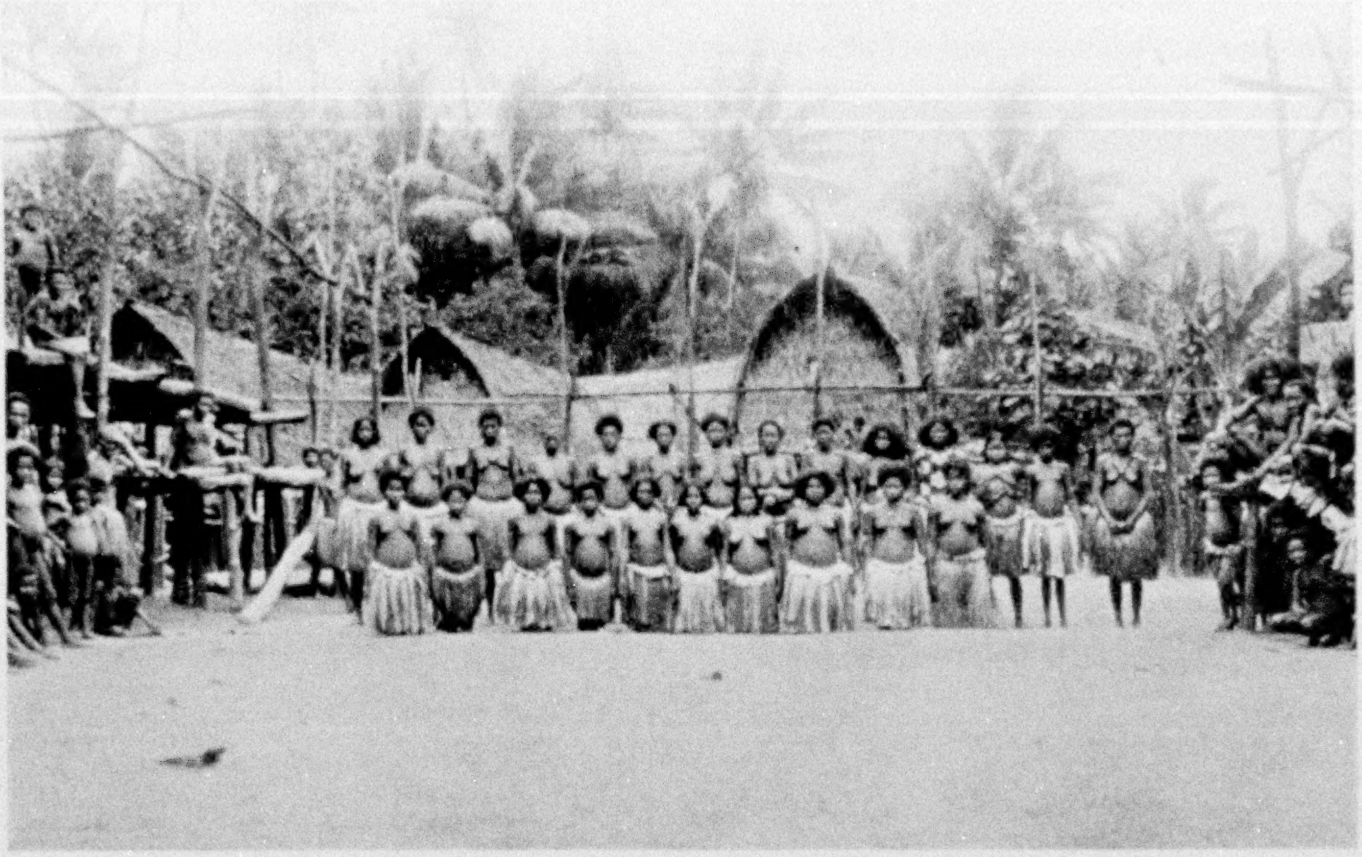
FISH ARE HUNTED WITH BOW AND ARROW

Shooting fish with bow and arrow is practiced here, as in most other parts of New Guinea. The fish arrow has four prongs of hardwood, not barbed but spread apart, at the point of attachment with the shaft, by means of a wooden plug bound between them. Spears for fish are much the same, but are larger and have more prongs. Fishing with these implements is done mostly at night with the aid of flares.

The large crabs of the Gulf of Papua are caught in great abundance and are an important trade commodity. With crabs the coast people of the Delta barter for tobacco with the inland tribes.

Just a short time ago there were recurrences of the violence and bloodshed that used to be common in the Delta Division. The natives of one of the Goaribari villages had been hostile toward natives on the Turama River, and a series of killings on both sides finally terminated in a massacre at a supposed love feast which was to mark the termination of hostilities. This was followed by a retaliatory raid, with taking of heads for trophies. The whole complicated matter was the subject of a Government inquiry at the time of our first visit to the Kikori.

At the Kikori police station a dugout paddled out to the seaplane to take us ashore.



Photograph by R. K. Peck

GIRLS ON HOOD POINT, NEAR RIGO, WEAR SKIRTS OF FRAYED SAGO LEAF

Photograph by Dr. E. W. Brandes

OUTRIGGERS PREVENT A CANOE FROM CAPSIZING IN ROUGH SEAS

On the islet in the background stands a village jail, tenanted largely by first-degree murderers. When the author visited the native jail at Kikori he found that of the 112 prisoners practically all were serving a few months each for first-degree murder (see, also, text, page 274).

Photograph by Dr. E. W. Brandes

STERN-VISAGED MATRONS FROM THE COAST EAST OF PORT MORESBY

Their hair is less kinky and their skin a bit lighter than that of the average Papuan, indicating an admixture of Polynesian blood. The necklace worn by the woman in front is made of clamshells.

We were hospitably received by the local manager of the Government rubber farm, all the officers being absent in connection with native troubles. We had thought to find a more pretentious settlement because of the large, bold-faced type used to indicate it on the map.

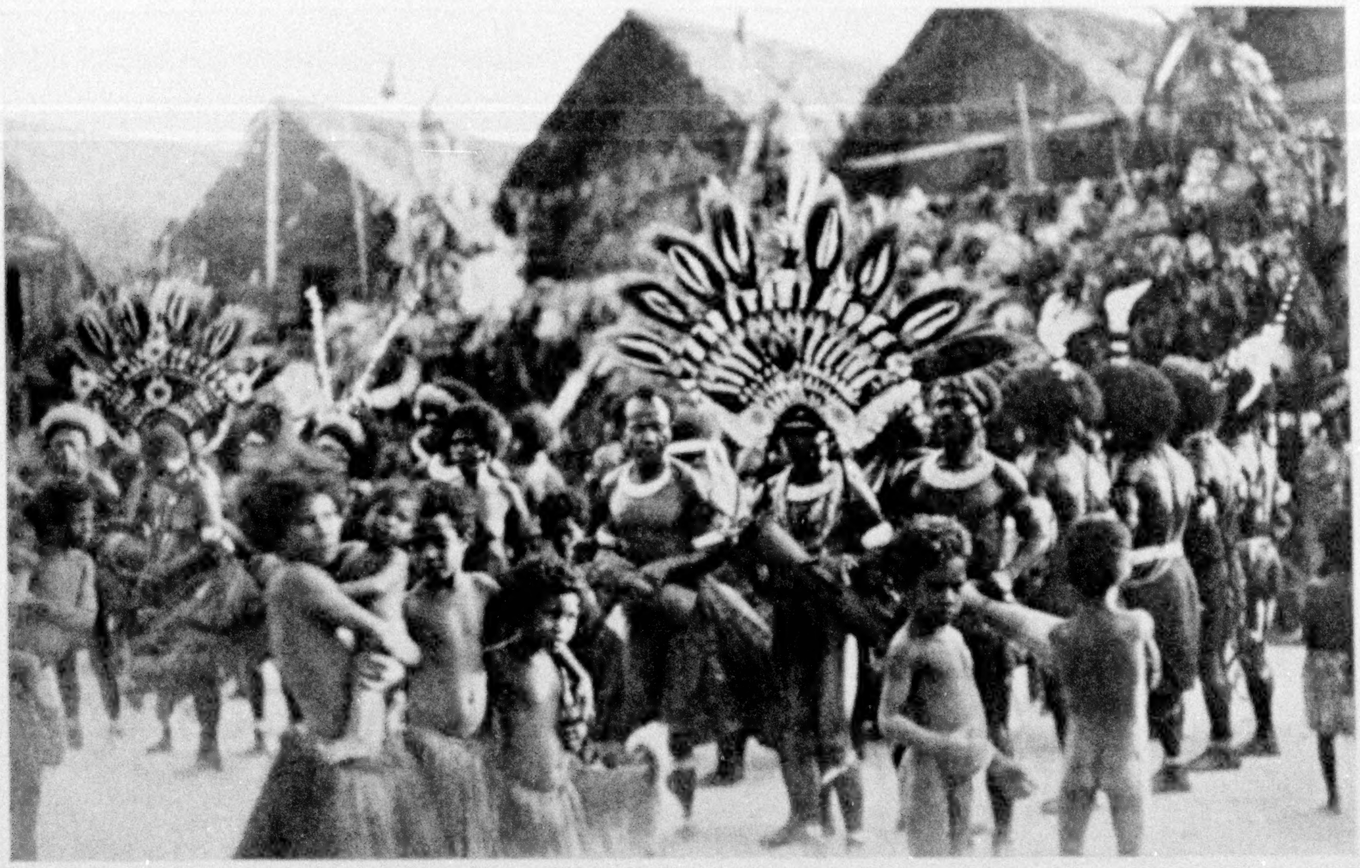
The station is on a small hill rising abruptly about 80 feet above the river. Short lengths of logs, secured by stakes, serve the purpose of treads and risers and enable one to climb to the top—a feat that would be difficult without them, on account of the rain that falls almost continually on the red, slippery clay at this season.

On top of the hill is a quadrangle of thatched buildings surrounding a level parade ground, bordered with crotons, hibiscus, and other brilliantly colored plants. The buildings consist of a headquarters house or office, barracks for the native police, a jail and infirmary for prisoners, storehouses, and three dwellings for the white personnel. We were told that the prisoners were all murderers, and I believe there were 112 of them incarcerated in the jail at the time of our visit.

MOTHER AND DAUGHTER ALONE BUT SAFE IN NATIVE VILLAGE

On the day after our arrival we were able to ascend the river to the native village of Ututi in a launch furnished through the courtesy of Mrs. Robinson of Ogamobu, a rubber plantation several miles upstream, the only commercial enterprise in this whole area. This charming and resolute woman and her young daughter were living in a plantation house, with only the protection of a faithful and devoted "boss boy," who presided over the plantation labor in the absence of Mr. Robinson, who was temporarily at Port Moresby, more than 200 miles away. That such an arrangement could be even thought of is a wonderful tribute to the success of the Government's system of establishing law and order, or at least instilling into the minds of these rude savages that the white man and his property are inviolable.

We were able to collect cane in the



Photograph by Alfred Gibson

IN A DANCE AT HANUABADA THE LEADERS WEAR GIANT HEADDRESSES OF BIRD-OF-PARADISE FEATHERS

Hanuabada, like Elevala, is a native village on the outskirts of Port Moresby.

gardens of several villages on the way, and finally arrived at Ututi, on the creek of that name, a tributary of the Kikori. This village has an unsavory reputation to live down, as it was here that Patrol Officer Kirby a number of years ago received one of the diabolical barbed arrows in his lungs and lived for two days transfixed, as the arrow was so fiendishly designed that it could neither be pushed through nor pulled out.

GIGANTIC CIGARETTE HOLDER IS USED AS COMMUNITY PIPE

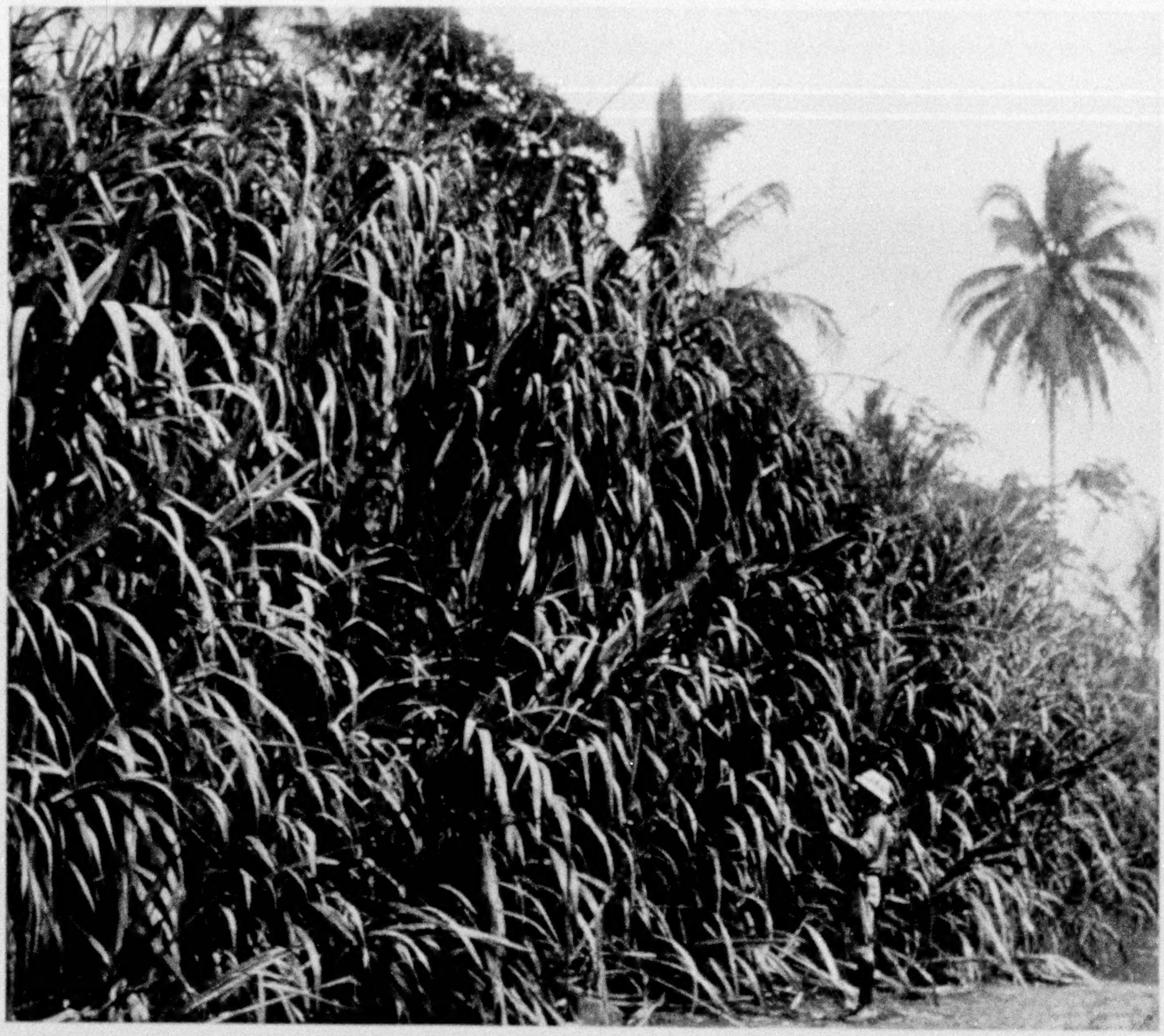
Ututi is elevated some ten feet above stream. It has a typical *dubu* (long house), which we were permitted to inspect after trading for sugar-cane specimens. A number of men, some clothed only in a shell pubic covering, lounged about, smoking the huge bamboo tobacco pipe or, more properly, cigarette holder.

This astonishing contrivance is about 2 or 3 feet long and 3 to 4 inches in diameter. It is open at one end, with a more slender detachable piece fitted at right angles into a small side-hole near the other end. The cigarette, rolled into a piece of fresh banana leaf, is inserted into the slender piece and the smoke drawn into the large tube by sucking on the open end of the latter. The slender tube is detached and the pipe is passed from hand to hand, each man taking a draft of smoke through the small side-hole, after which the slender tube with smoldering cigarette is replaced and the process repeated.

Some of these pipes are artistically carved and highly polished.

Pitiful wrecks of dogs growled and slunk into dark corners as we passed through the long central corridor of the clubhouse. On either side were stalls partitioned off, presumably for the exclusive use of individuals to sleep in or as a repository for their trophies, weapons, utensils, and personal gear.

Hearths of undetermined material were built into the floor near the walls. They were heaped with ashes, some smoking and filling the place with an impenetrable haze, as there was no smoke outlet or provision for ventilation other than the generally flimsy structure with wide cracks in floor and walls. The interior was most gloomy, there being no windows



Photograph by Dr. E. W. Brandes

SOME PAPUAN WILD SUGAR CANE GROWS TO A GREAT HEIGHT

This clump of wild cane, *Saccharum robustum*, with Pemberton of the American Expedition in the foreground, was found on the Laloki River, near Prison Garden, about 17 miles from Port Moresby. The species may prove of value for breeding purposes because of its strength and size.

and in fact no openings excepting the total lack of front and rear walls. After a long walk we arrived at the rear "veranda," where a number of pig and crocodile skulls were on display.

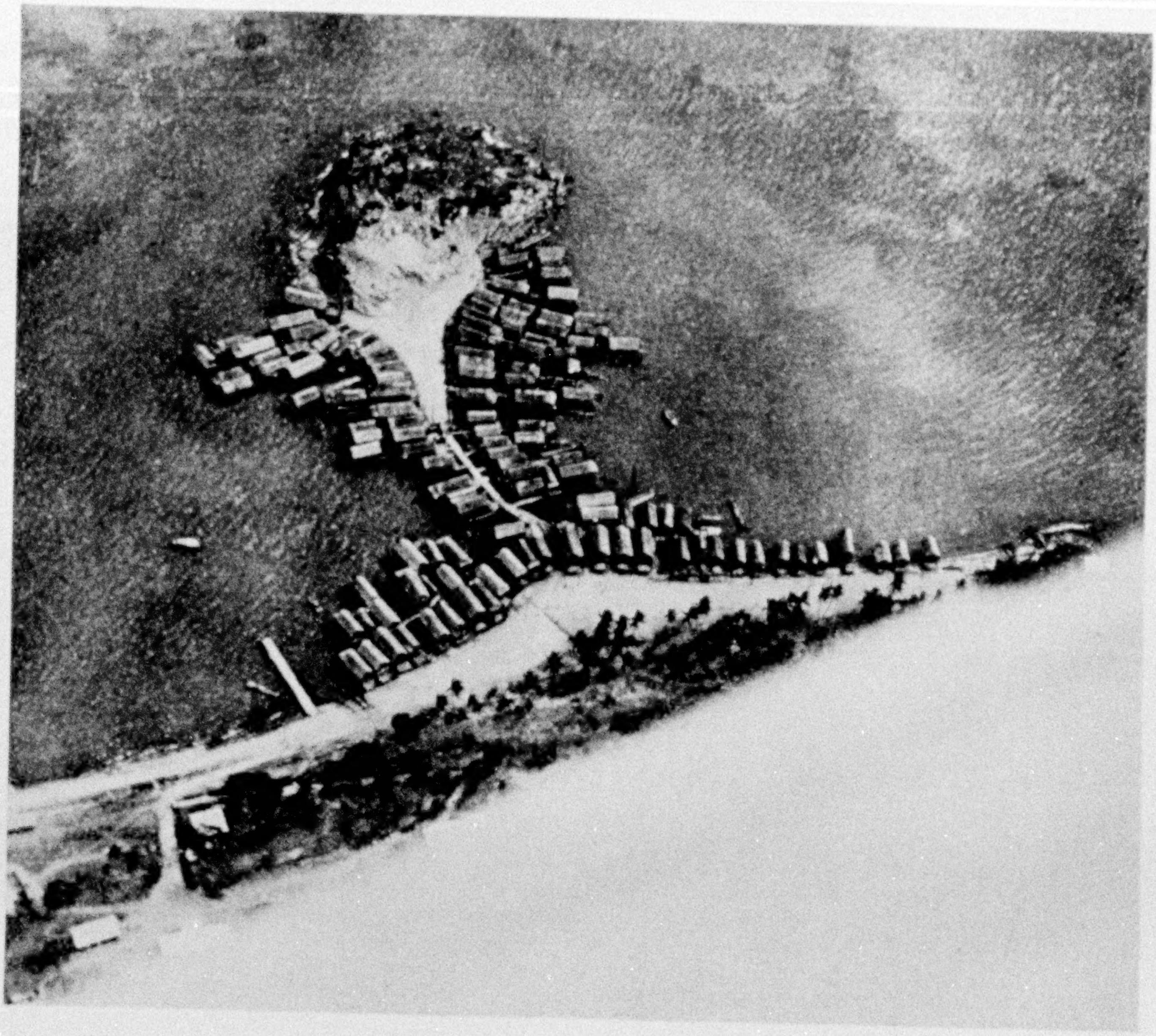
More dogs howled in the bush behind the long house. The native dog has no bark; his voice is a long-drawn, quavering wail. They usually wail in unison and it is a distressingly human sound.

TOBACCO LONG KNOWN IN NEW GUINEA

We saw a few miserable-looking women, but not a single child in the whole village. Beside one of the family dwellings was a small planting of tobacco with attenuated leaves. Now, we have been brought up to believe that tobacco was unknown, except in America, up to the time of Sir Walter Raleigh's famous introduction of the smoking habit to 16th-century English courtiers; but there is certainly evidence that it has been known and universally used in New Guinea for a long time.

Through our interpreter brought from Kikori Station, I learned that the seed of this particular tobacco patch was originally brought from the Samberigi, an isolated valley north of this place. This tobacco had ripe seeds, which we brought to Washington, and it will be interesting to learn if it is a species unknown to America.

Trade of a desultory nature is carried on by these people with the inhabitants of



Photograph by Dr. E. W. Brandes

COAST DWELLERS BUILT THEIR HOMES OVER THE WATER AS A SAFEGUARD AGAINST RAIDS OF HEAD-HUNTERS FROM THE HILLS

A crude bridge connects the mainland with the rocky island of Elevala, one of the three native settlements adjacent to Port Moresby. In the left foreground is a small pier, which looks from the air like a white log jutting out from the shore.

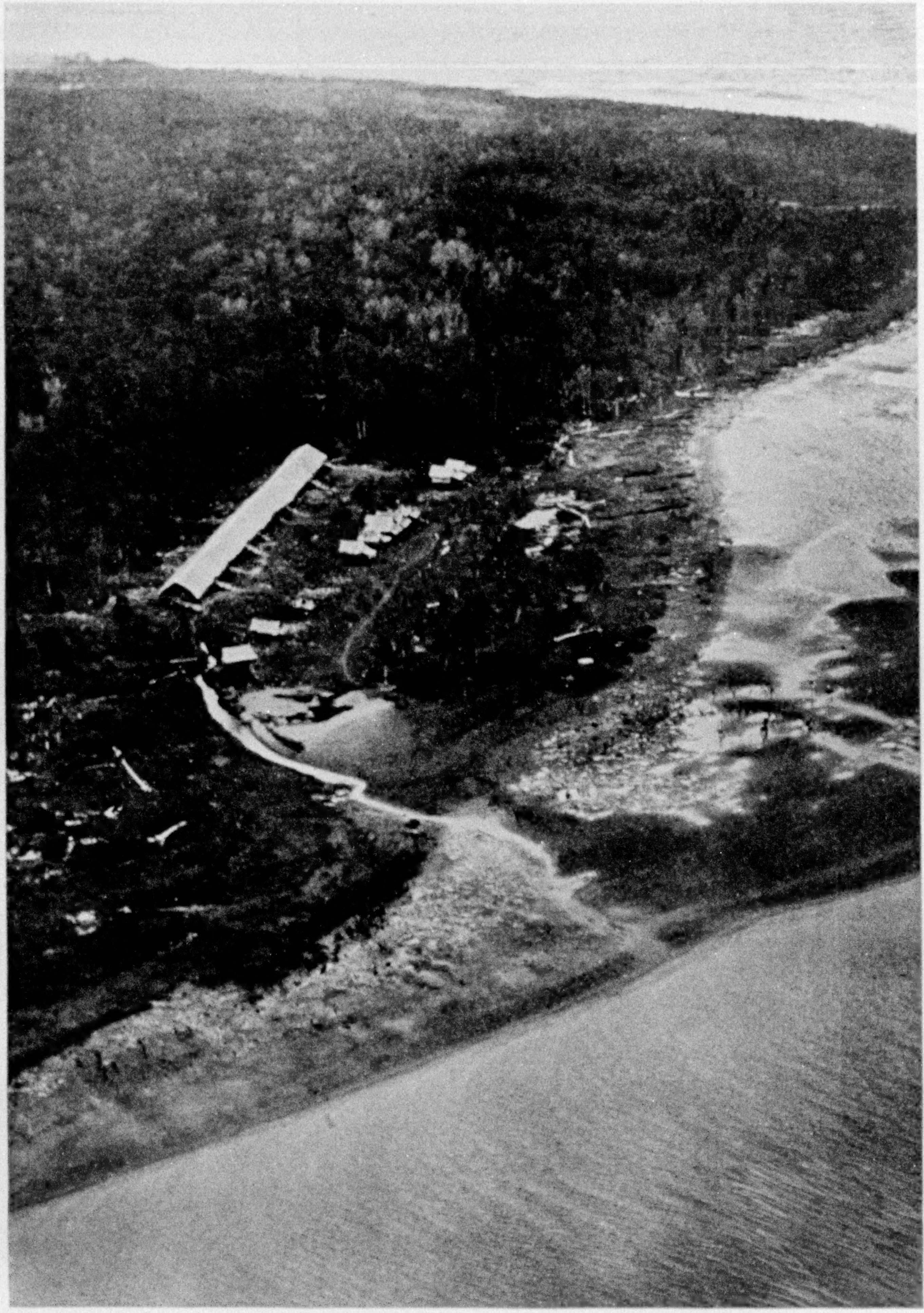
the Samberigi. The only known outlet for the latter is through a watercourse in a deep ravine, impassable except during the dry season. They come to a point intermediate between their valley and the Kikori River villages and trade in this "no man's land" during a fixed period of truce, when the two peoples mutually agree to refrain from acts of violence. Before or after this truce, it is fatal to cross the dead line!

During our stay there was a fitful arrival and departure of canoes, usually with only one individual in each, invariably carrying bow and arrows and baskets made of the leaf sheath of a palm ingeniously folded and pinned, so that it made a convenient receptacle for lumps of sago, shrimps, or other food. These people all seemed rather sullen and went silently about their business. They did not even cast a glance in our direction. Some were literally caked with mud and filth.

We returned to Kikori, depressed by the sight of Nature's masterpiece, man, as represented by such a primitive people.

Next morning Dr. Jeswiet and Pemberton started on a collecting trip by launch to Aird Hill, where a mission station is located, and Peck and I took off for Everill Junction, the confluence of the Fly and Strickland rivers (see inset map, page 255).

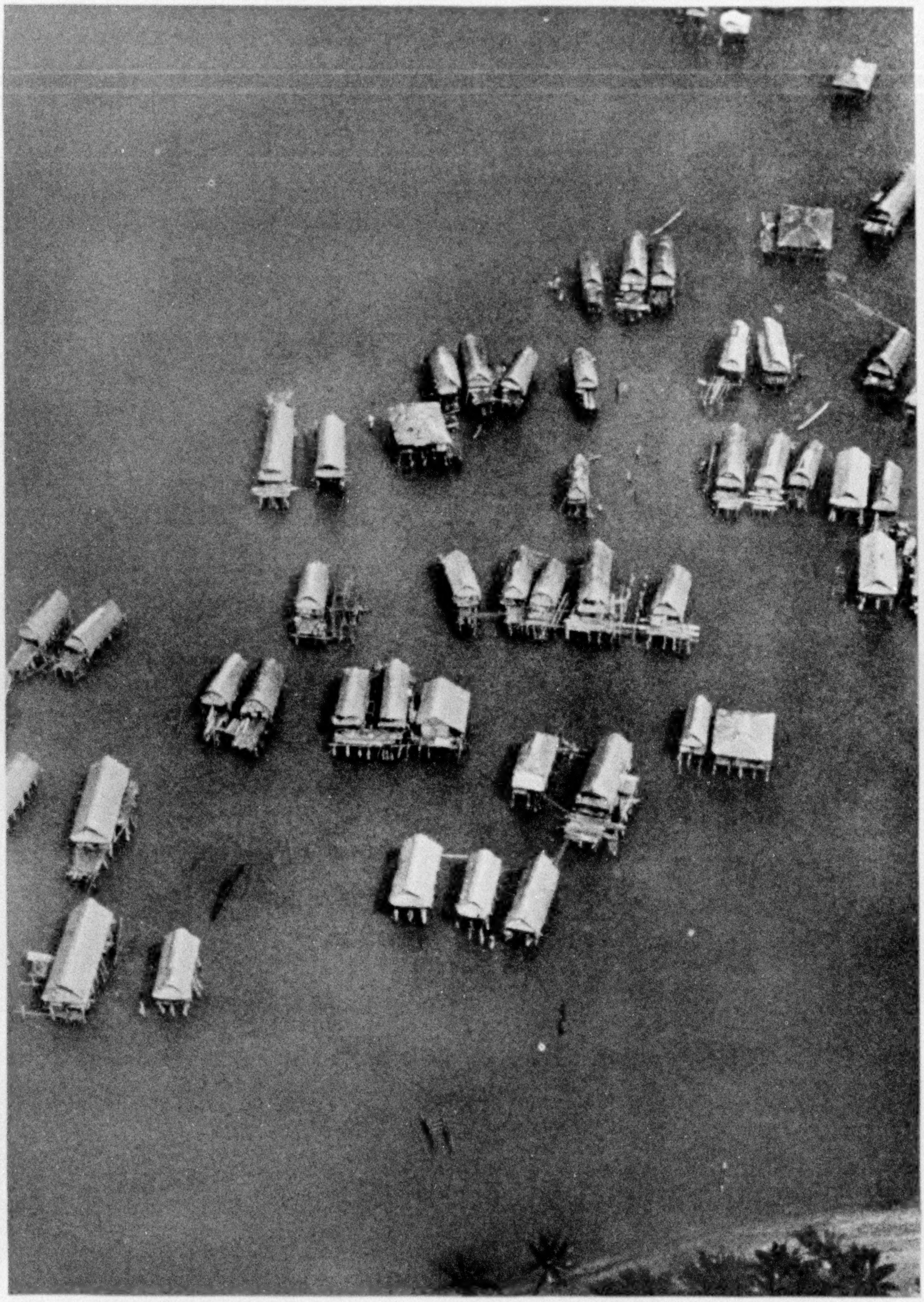
It may be interesting to draw a comparison between our two modes of travel.



Photograph by Dr. E. W. Brandes

A DUBU, OR MEN'S COUNCIL HOUSE, ON THE FLY RIVER

Such enormous structures are used primarily by single men, but husbands also retreat to them from time to time. This dubu is about 350 feet long and 40 feet high. Some dubus measure 600 feet in length. No woman may enter.



Photograph by Dr. E. W. Brandes

FROM THE AIR, NEW GUINEA'S COASTAL VILLAGES RESEMBLE GIANT WATER STRIDERS

The inhabitants of this important village of Hula, near Port Moresby, are among the most intelligent and aggressive natives of Papua. Some Polynesian blood is in evidence here, whereas in most of coastal New Guinea Melanesian stock is predominant.

Photograph by Dr. E. W. Brandes

AN AIR VIEW OF A PALM-FRINGED BEACH BETWEEN YULE ISLAND AND THE KIKORI RIVER

Among the coconut trees a village is half hidden, and native fishermen, frightened by the passing plane, are rushing homeward from the surf.

The launch had a 20-mile round trip to negotiate that day, but, owing to strong adverse tides, it was so delayed that darkness was approaching when the party was ready to start back to Kikori. It did not return at all that night. The seaplane returned, after a 700-mile trip to the deep interior, interrupted by three landings and inspection of a proposed camp site en route; then went over the route to Aird Hill, searching for the launch; discovered it, and returned to Kikori, all between 9:39 a. m. and 5:59 p. m.

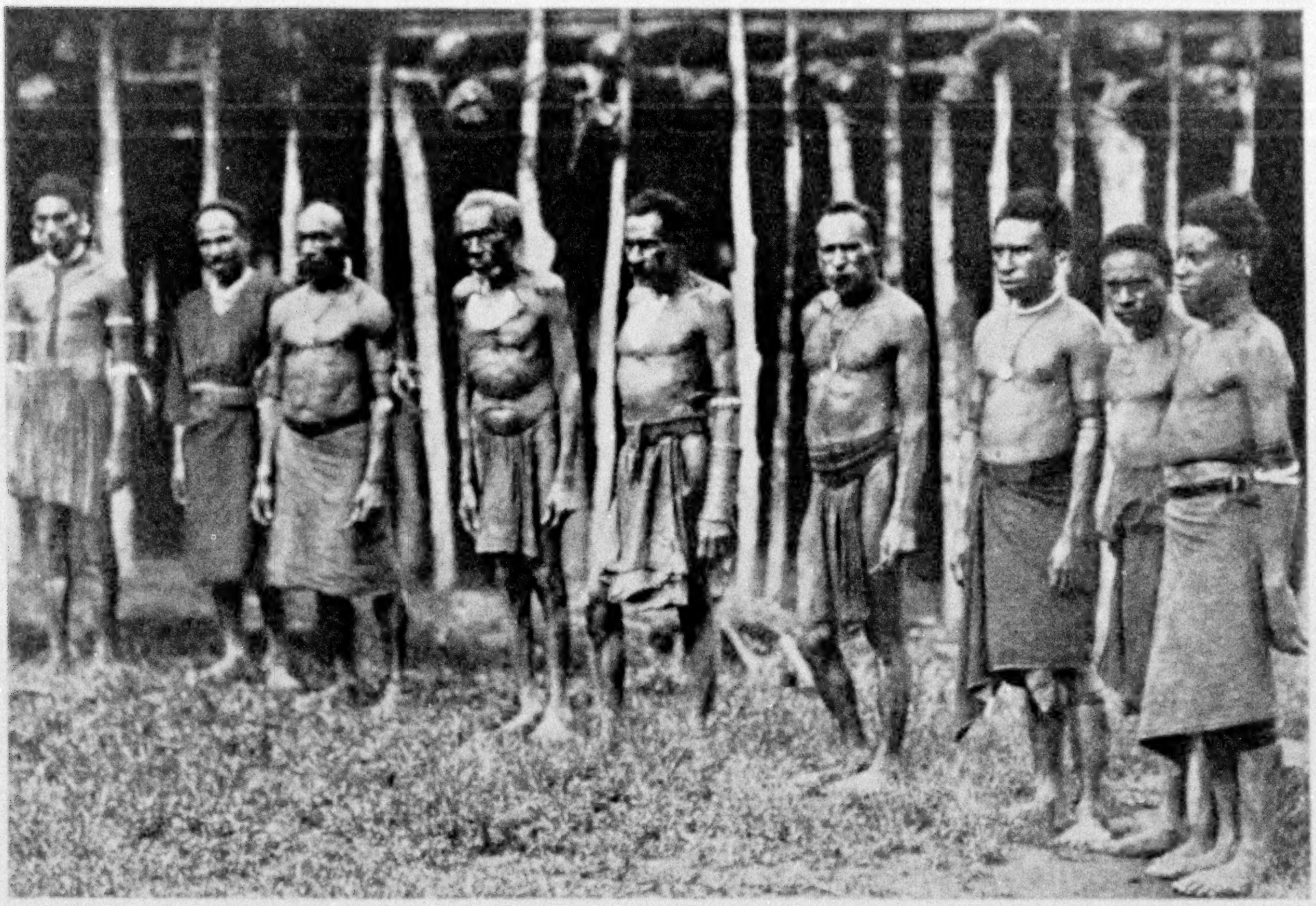
THE "VANAPA" STARTS WITH CAMP SUPPLIES UP THE FLY RIVER

It was on June 27 that the *Vanapa* had left Port Moresby, with our heavy gear, supplies, and most of the personnel, bound for some point near the junction of the Fly and Strickland rivers. Counting slight delays, I had calculated that the journey would require three weeks.

We wished now to make a reconnaissance ahead of the *Vanapa*—that is, to save time by inspection of the banks for a suitable camp site, and then to come back, find the vessel, and leave instructions with those aboard. So, with full tanks and stores as a precaution against forced landings in this wild country, we took off on July 12 from Kikori.

We flew first to the Turama River, to drop mail at the temporary police camp under construction there. We discovered this camp and flew over it. It is a wild spot and it gave us a pretty good idea of the conditions under which the officers of the Papuan service carry on their hard, hazardous work. Fortunately, the service is not lacking in men who possess the qualities of perseverance, courage, and diplomacy in dealing with the natives under most disheartening conditions.

We proceeded southwest and passed over the mouth of the Bamu. This stream is known for its astonishing tidal bore, so dangerous to small craft. We did not see the bore during our trips across the river, but it was described as a white-crested wall of water 9 feet high, extending from bank to bank.



Photograph by Dr. E. W. Brandes

STALWART SAVAGES OF UTUTI VILLAGE, ON THE KIKORI RIVER

Some of these men were implicated in Patrol Officer Kirby's murder (see text, page 275).

Continuing beyond the Bamu, we flew over a number of villages built on the tidal flats bordering the streams that form a network of inland waterways here. For the most part, these settlements consisted of the typical long house, of immense size and length, and a few huts secreted among the trees back of it.

Dozens of long dugout canoes without outriggers could be seen drawn up on the muddy flats, and a few similar ones scurrying for the shore, propelled by naked paddlers standing erect. The villagers, as active as ants whose nest is kicked by a careless boot, were plainly thrown into panic by the sudden appearance of our plane.

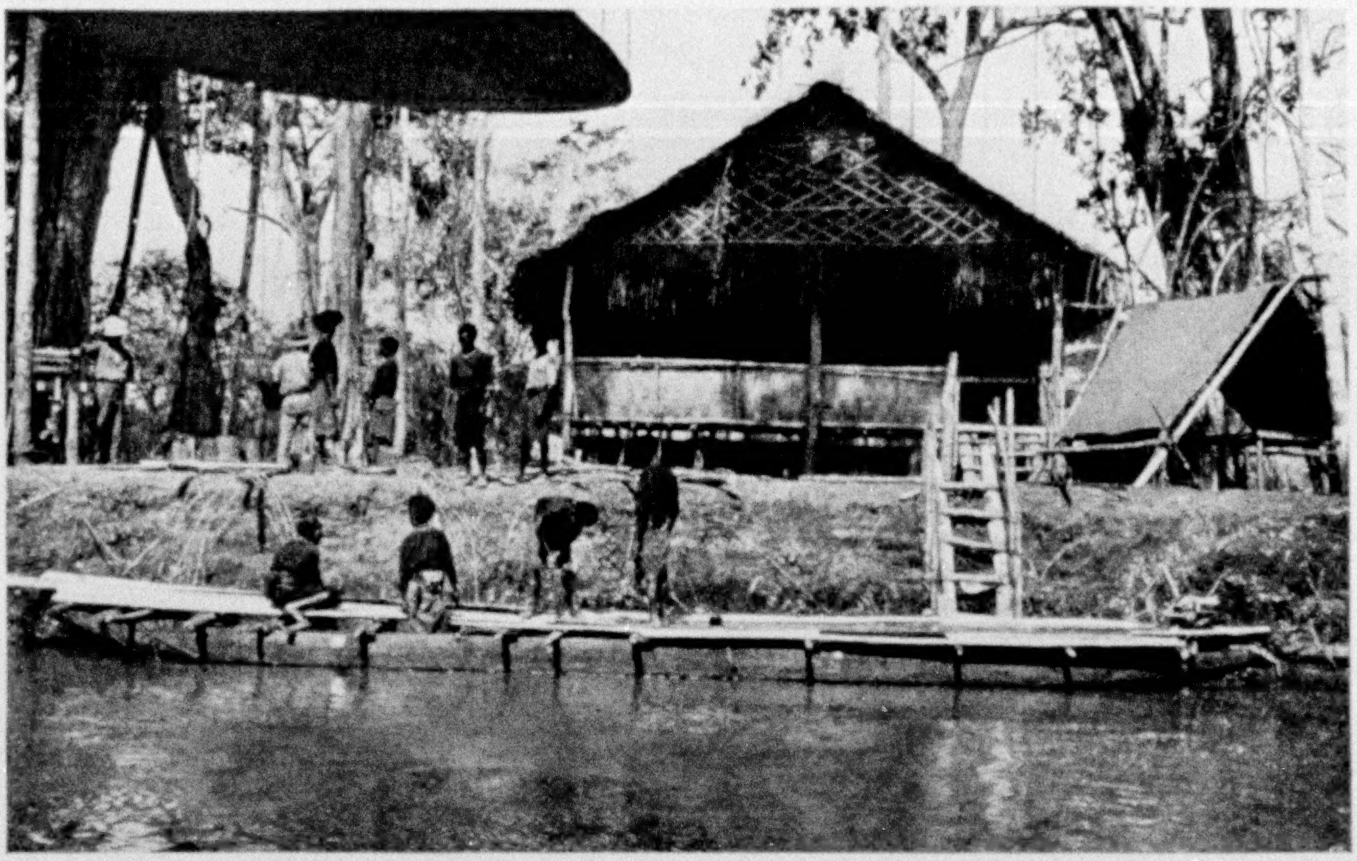
OVER THE ISLAND-STUDDED ESTUARY OF THE FLY RIVER

By 10:45 we had reached the left bank of the Fly River and saw for the first time the vast, island-studded estuary of that famous stream. Although more than 5,000 feet above the sea, we were out of sight of the right bank and could realize the dilemma of those early navigators, who were so confused by its numerous channels that they did not know if they were viewing one or a number of rivers.

Joseph B. Jukes, chronicler of the voyage of H. M. S. *Fly* in 1842, records that when ten miles offshore the water was muddy and only slightly brackish, so Captain Blackwood decided it must be the mouth of a large river. On this evidence Blackwood is credited with the discovery of this mighty stream.

A missionary, the Rev. S. MacFarlane, was the first to offer proof that it is indeed a river. In 1876, with Luigi Maria d'Albertis, the Italian naturalist, he ascended it in a small steamer as far as Ellangowan Island. To D'Albertis, however, belongs the credit for the first real exploration of the Fly River, when later, in 1876 and in 1877, he penetrated more than 500 miles into the interior in a steam launch. His maps, published in 1880, are a monument to the industry and endurance of this naturalist of the old school.

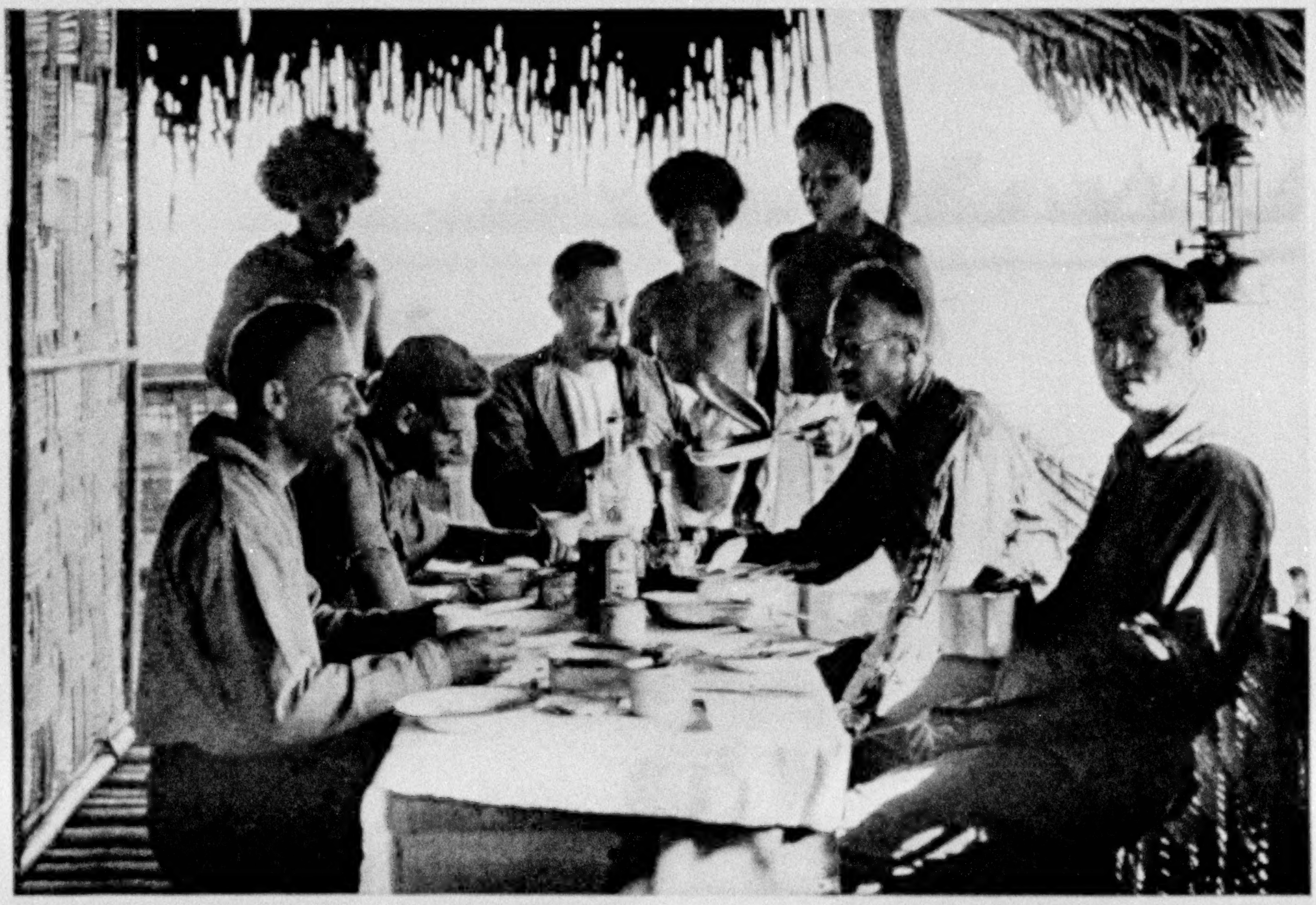
Aside from the exploration of the Strickland by Captain Everill and the discovery of Lake Murray by Massey Baker's party in 1913, the only recent milestone of importance in exploration of the Fly water-



Photograph by Dr. E. W. Brandes

BASE CAMP ON THE FLY AND STRICKLAND RIVERS

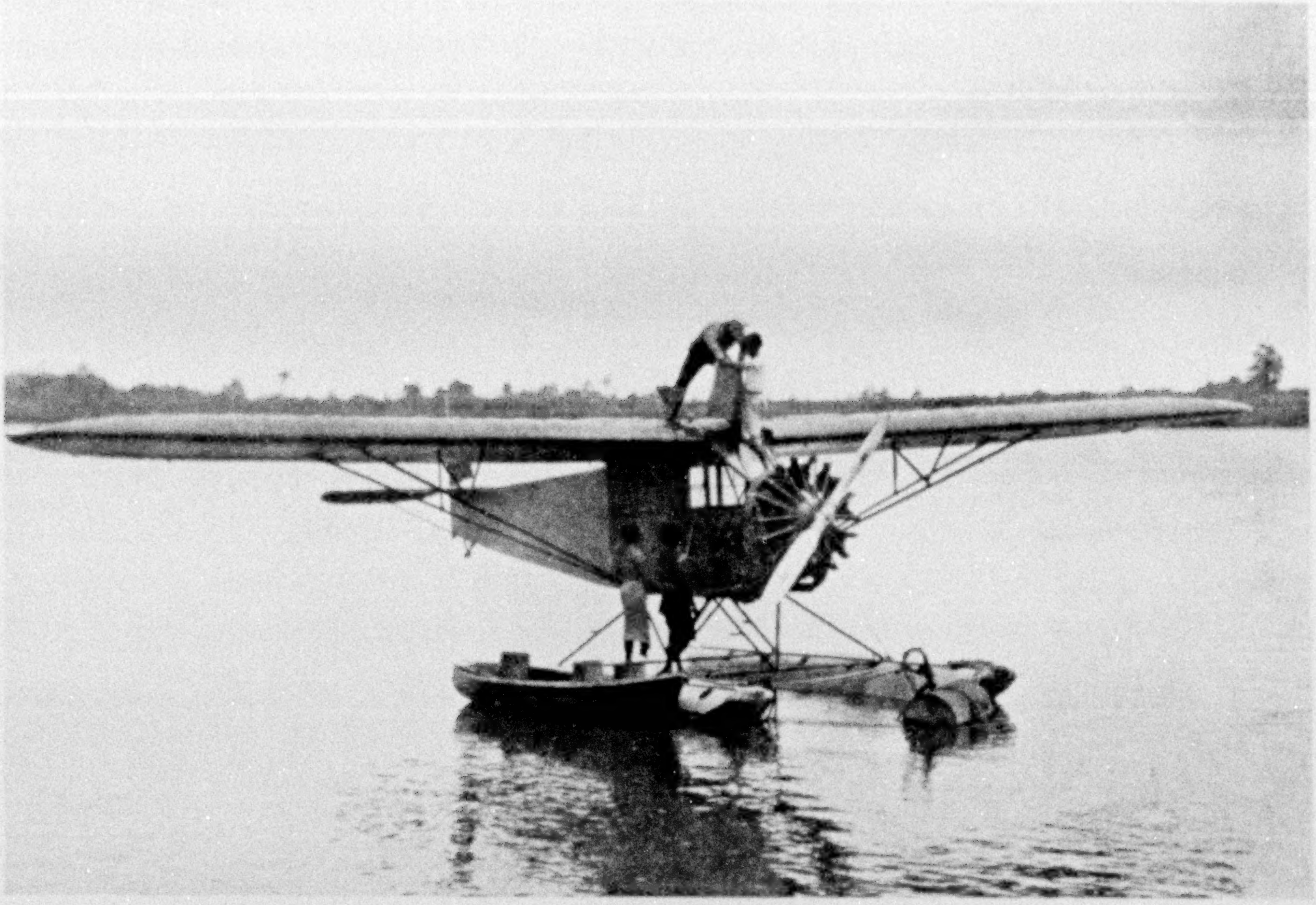
In the foreground is a twin-cylinder, outboard, motor-powered, double canoe, which could travel at the rate of six or seven miles an hour when loaded with several tons of gear and provisions. A trade ax worth 55 cents bought two such canoes, representing months of labor. Note the wing of the airplane at the upper left.



Photograph by Dr. J. Jeswiet

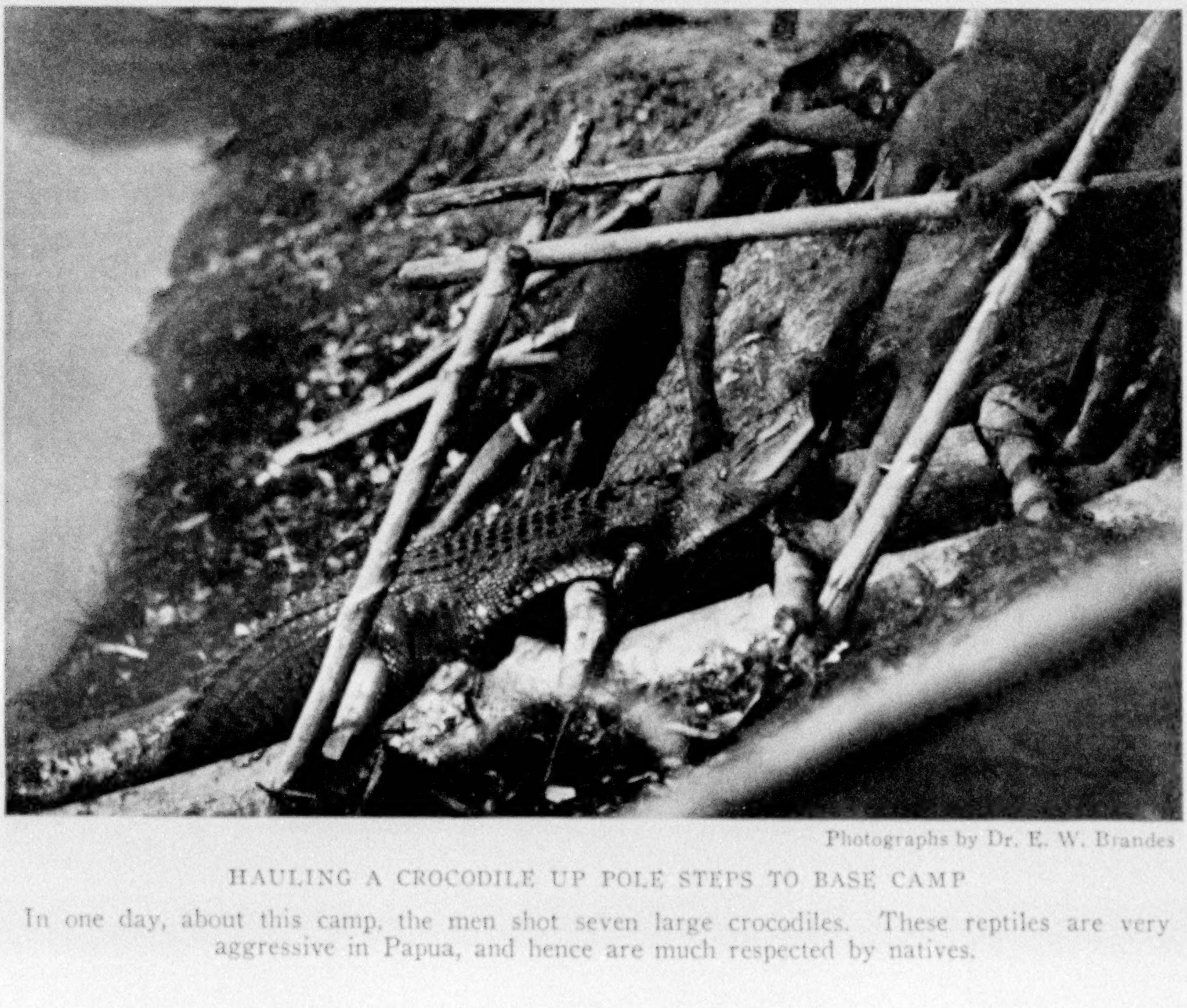
THE EXPEDITION DINES AL FRESCO

Left to right, as seated: Peck, Champion, Brandes, Pemberton, and Bannon. One of the chief hardships of the Expedition was occasioned by the pest of winged insects.



PILOT PECK "GASSING UP"

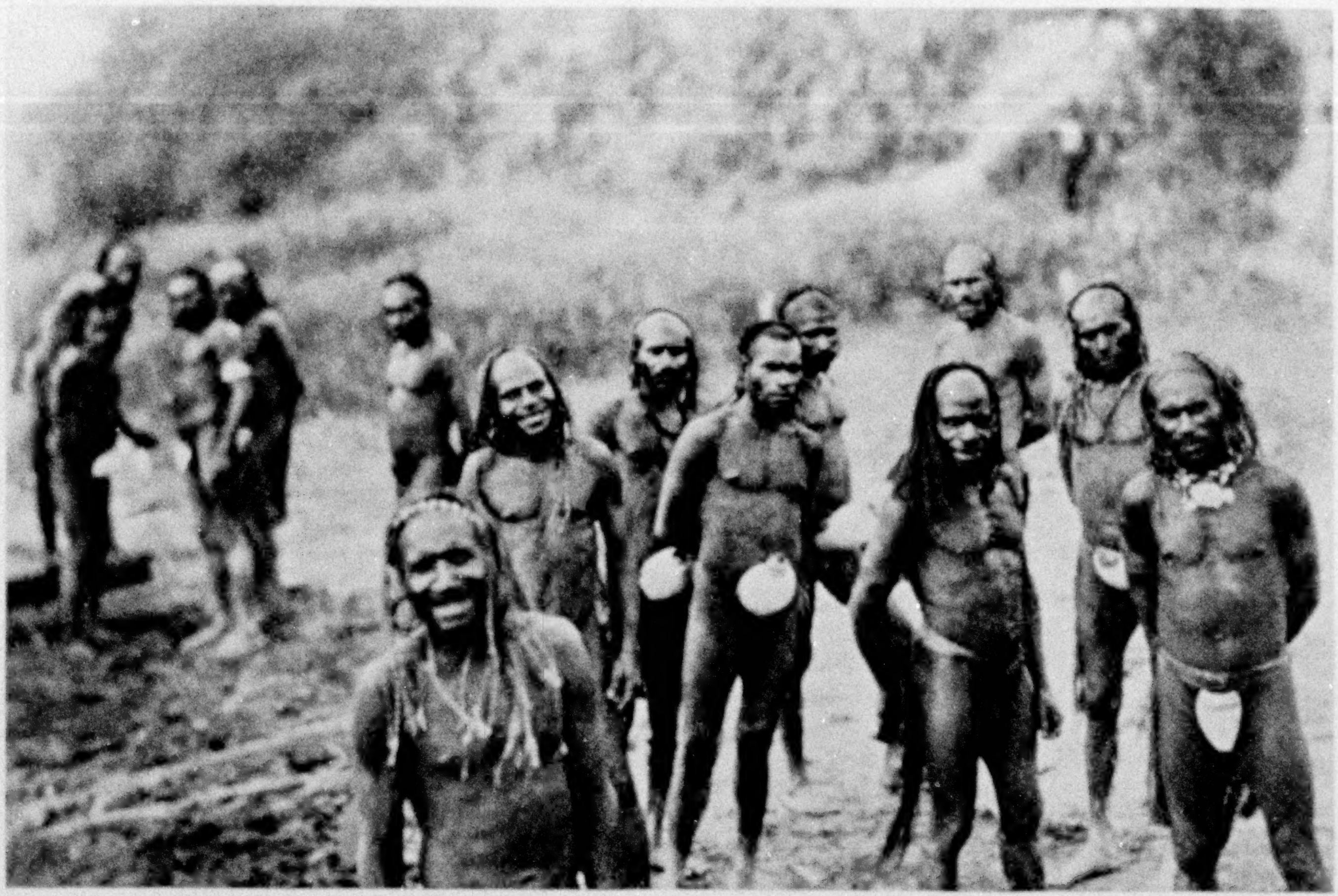
Whether gas and oil will actually be waiting at the spot where it is hoped to find them is the constant nightmare of flyers in wild countries. The seaplane used by the Expedition could carry sufficient fuel to make a round-trip flight of 800 miles with safety. It was designed with folding wings and was completely assembled when taken from the steamer at Samarai.



Photographs by Dr. E. W. Brandes

HAULING A CROCODILE UP POLE STEPS TO BASE CAMP

In one day, about this camp, the men shot seven large crocodiles. These reptiles are very aggressive in Papua, and hence are much respected by natives.



Photograph by Dr. E. W. Brandes

CURIOUS, YET TIMID, THEY STUDY THE RECENT ARRIVALS FROM THE SKY

After two hours of coaxing, these natives of the upper Strickland River region came out of the jungle, whence they had fled at the sight of the seaplane hovering over their village.

shed was erected in 1928 by Messrs. Karius and Champion, of the Papuan Government service. They followed the Fly to its headwaters, then crossed the towering Victor Emanuel Range, and descended via the Sepik to the Pacific Ocean. In importance and general interest this extraordinary feat, which occupied more than half a year, ranks with the best modern conquests of unknown territory.

WE "WASH" TWO LARGE ISLANDS OFF EXISTING MAPS

We followed the left bank of the great river, flying at 6,000 feet almost due west, passing over 15 or 20 native settlements. In them stood dubu houses of extraordinary size, some at least 500 feet long.

By 11:15 we had left the last of the estuary islands far behind. But the river was still several miles wide, and both banks were thickly wooded for one-half to five miles back. Beyond this ribbon of jungle were poor scrub and grass prairie. From our elevated position we could see in the clear air for a great distance, but the country was perfectly flat as far as the eye could reach.

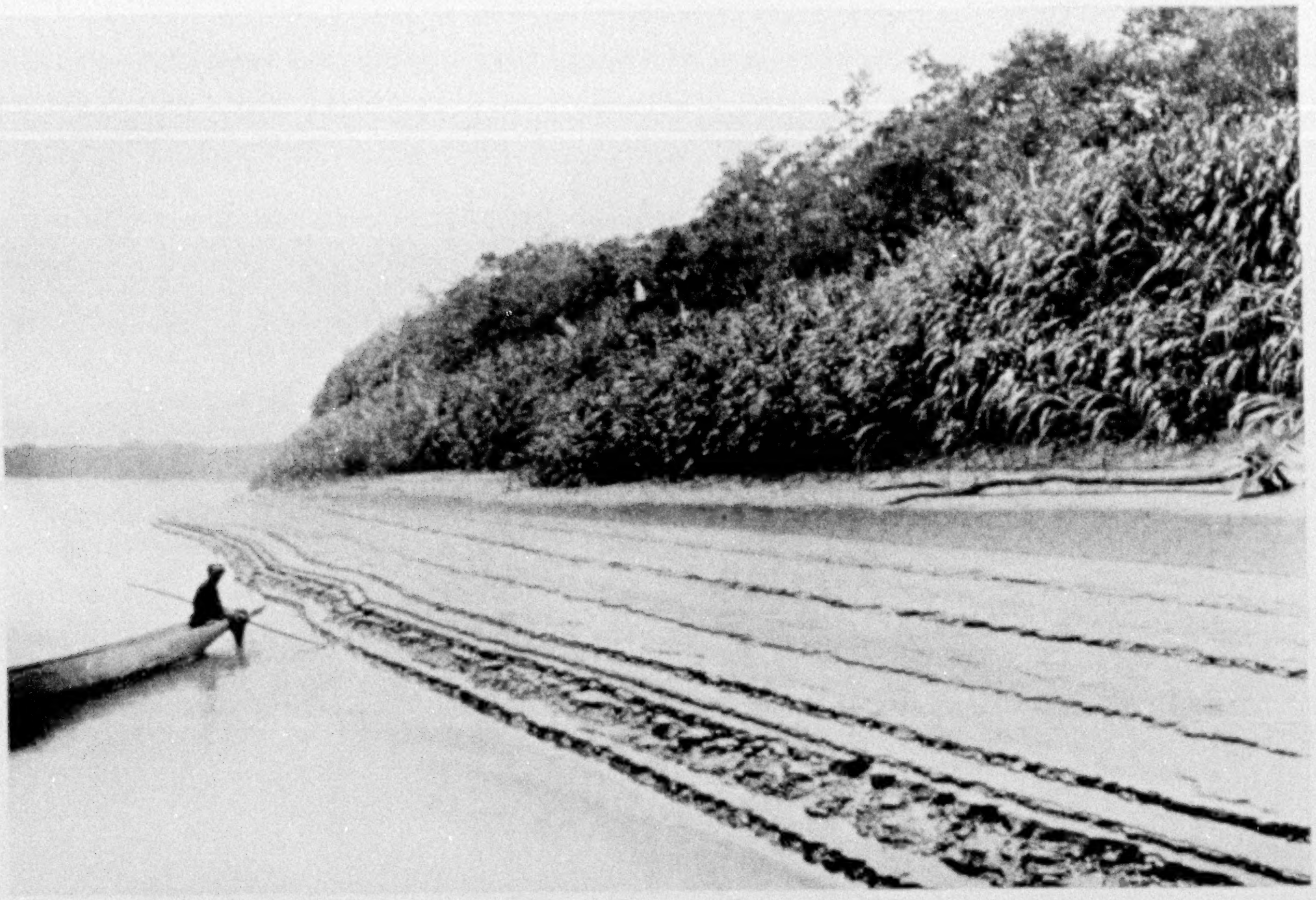
We began now to see the possibility of checking up on the geographical features of the country, as represented on the recent charts in our possession. Without going out of our way, it seemed an easy matter to correct the slight inaccuracies of the charts and thus perform a service that might be welcomed.

The great Fly River, in common with similar streams, is gradually but continually changing its course. Oxbows are being pinched off, leaving semicircular lagoons. Islands are building up with silt; others are wearing away or becoming one with the mainland, and from the vantage point of our position many of these processes were unfolded with startling clearness.

As a beginning, we washed off the map two large islands which simply no longer exist or never had!

It occurred to me, furthermore, that we were about to see spread before us some 40,000 square miles of territory in western Papua and Dutch New Guinea, only a small proportion of which had been seen previously by civilized men.

From an altitude of nearly three miles,



Photograph by Dr. J. Jeswiet

ALONG THE MUDDY BANKS OF STRICKLAND RIVER WILD SUGAR CANE GROWS LUXURIANTLY

In such favored spots as this the Expedition found many of the varieties it desired. Here the species *Saccharum robustum* is shown in bloom.

attained many times, we later beheld on clear days an area equivalent to one-third of the total covered by the Territory of Papua.

THE FIRST AIRPLANE TO REACH THE INTERIOR OF PAPUA

No airplane had previously been in the interior of the Territories of Papua and New Guinea, although flying boats had skirted the coast and a land plane had on one occasion made the perilous trip over the mountains of the eastern peninsula. I therefore devoted a part of my time during our numerous flights to photographing and sketch-mapping lakes and other features not on existing charts. These features are shown in their approximate locations on the map on page 255. They are roughly tied in with known and described points, and the most that can be said for our cartographic contributions is that they demonstrated to the authorities in Papua the practicability of surveys with seaplanes.

For the next 100 miles there was no sign of habitation on the Fly, although we occasionally saw smoke 12 to 15 miles back from the river, sure sign of the presence of man in this humid country, in which spontaneous fires never occur.

At noon the *Vanapa* was sighted 8 or 10 miles ahead, still some 60 miles from her destination. We landed beside her and taxied into the bank. Two wild varieties of sugar cane rewarded my efforts here while waiting for a small boat from the ketch.

YOUNG LADIES FROM AMERICA SUDDENLY APPEAR

Once aboard the *Vanapa*, we were relieved to find everyone well and were somewhat astonished to discover among the passengers two young ladies in shorts, who spoke with an undeniable American accent (see, also, page 267).

They proved to be from Cleveland, an artist and her companion on a sketching trip around the world. Far indeed they were from the tourist trail. They had wheedled our captain into taking them

Photograph by Dr. J. Jeswiet

A CIVILIZED NATIVE SOLDIER DETAILED TO GUARD THE EXPEDITION'S BASE CAMP

In his hands he is holding panicles of a tall grass, *Imperata arundinacea,* resembling sugar cane.

along when he had stopped at Daru. It is certain that they will never be farther from home than on the Fly River. The captain had pitched a wall tent on the flat roof of the aft cabin to accommodate the strangers, and, surrounded by all the comforts of home, they surveyed the jungles primeval.

We had tea and biscuits in good Australian fashion. Then we took off, with Mr. Ivan Champion, to fly to a place we had now agreed upon as a rendezvous—a camp previously used by the Government patrol in pursuit of raiders who had massacred the inhabitants of Weridai, a village on the lower Fly. It was our good fortune to find this site habitable. We flew up the Strickland a way, got a distant view of Lake Murray, then returned to the *Vanapa.*

All plans for occupation of the base camp seemed to be progressing satisfactorily, so we returned to Kikori. Next day, Friday, the 13th of July, with Jeswiet and Pemberton aboard, we embarked on our 13th flight in New Guinea. The long trip back to Port Moresby in a half gale was uneventful; but once, in experimenting on the time capacity of the left-wing tank, it went dry. We nosed down from an elevation of 2,500 feet to about 100 feet above the angry sea, far out in the Gulf of Papua, before the motor took hold again! Yet, even after this experience with all the forces of the calendar against us, we still felt that the seaplane was our safest vehicle for exploring New Guinea.

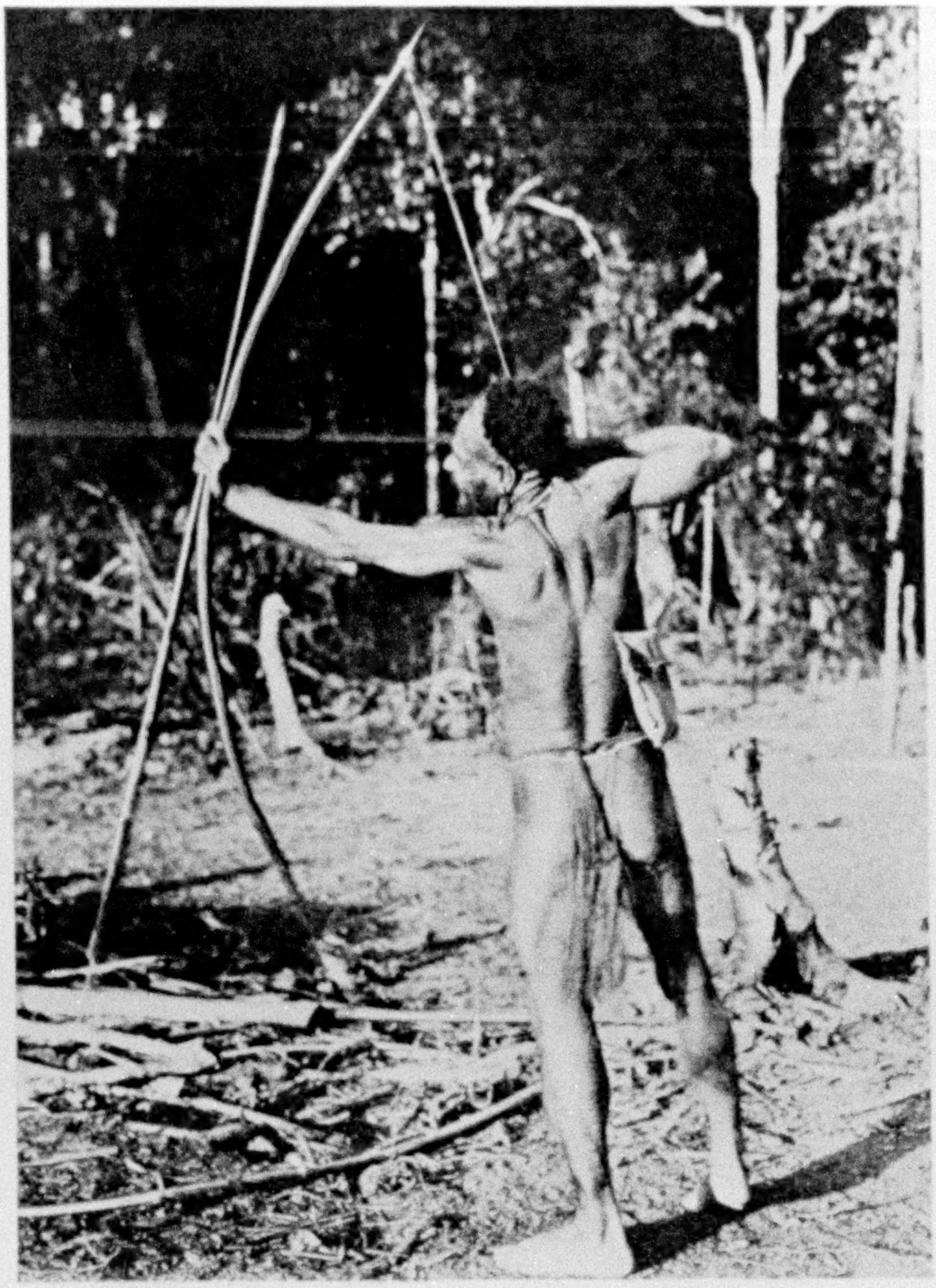
After preparing our sugar cane for shipment, and storing it in the Port Moresby ice plant pending arrival of an oversea steamer, the entire scientific party took off once more for the base camp, to start in earnest our search for sugar cane in the untamed regions where it and almost everything else were reputed to be very wild.

NATIVES VISIT BASE CAMP ON ONLY TWO OCCASIONS

We got to our Fly River camp on July 21 and found everything shipshape. Daily routine was established. A strict military régime was maintained, with sentries pacing their beats at night. But nothing happened to indicate hostile intentions on the part of the natives. In fact, we were visited by them only twice. Once a group came in a canoe, with an 18-foot python twitching its tail despite fearful wounds. They doubtless brought it as a propitiatory offering to grace our table, for they enjoy snake meat.

The second visit was opportune for us. We had just shot a crocodile in front of camp, and no one was yet familiar enough with the necessary handholds to maneuver a supposedly dead reptile of this size up the high, slippery bank. But these wild gentlemen seized it with apparent unconcern, and tugged and hauled its huge bulk to the place designated. The tenacious hold on life of these creatures is well known, so Peck was suspicious enough to put two more bullets into its head. Despite this, it crawled about during the night, but without injuring any one.

The rains had now ceased and the camp had become almost dry, except for water in the deep, gaping cracks in the sun-dried earth. This furnished a breeding place for mosquitoes. Among them Pemberton found three species of Anopheles, the malarial mosquito. A large gray Culex was prevalent in such numbers that we were unable to sit down to lunch, but paraded in a circle about the table, reaching for a plate of beans in the manner of those patronizing well-conducted buffet luncheons. The order was "under the nets at sundown" or take the consequences.



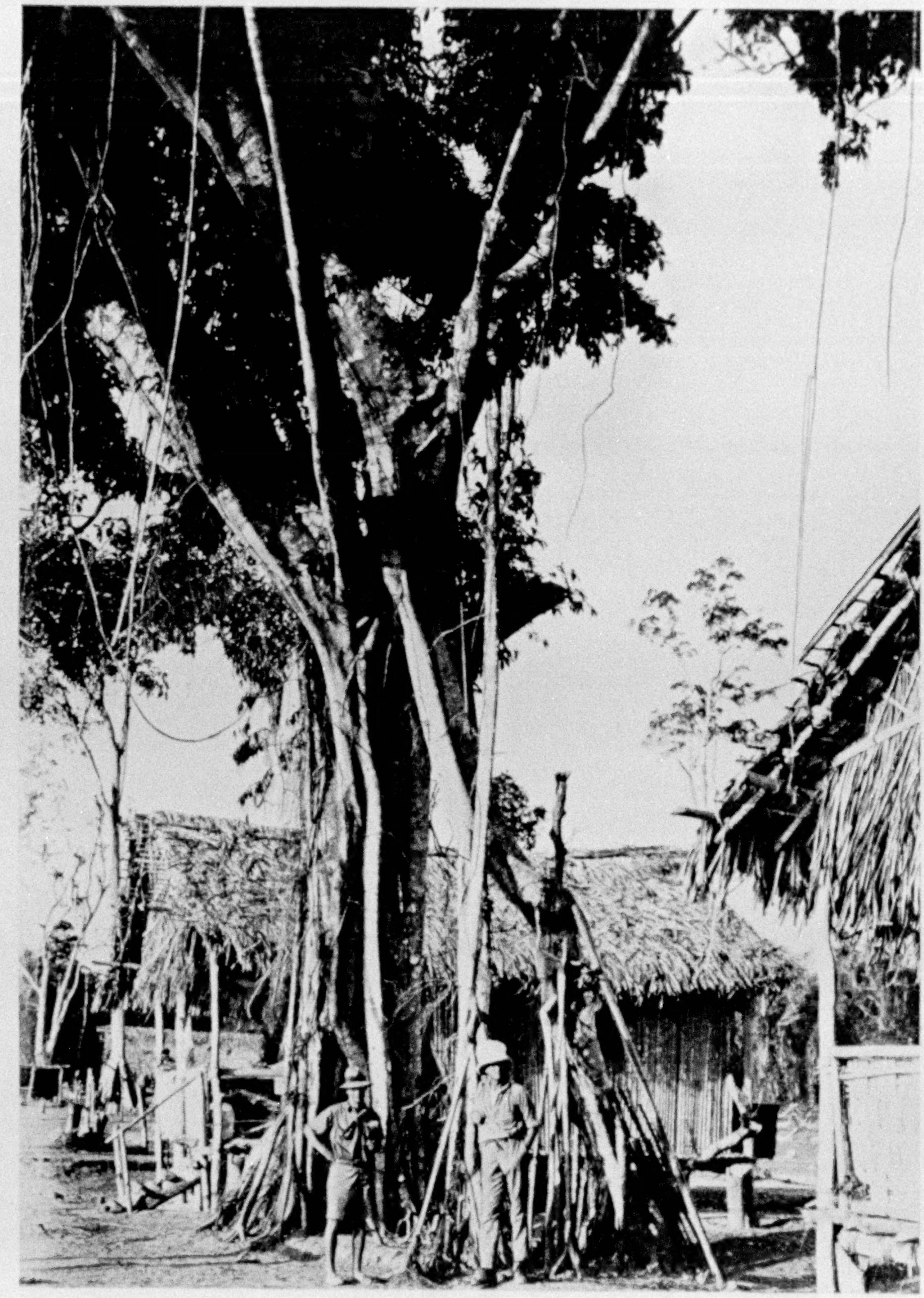
Photograph by Dr. J. Jeswiet

FOR RAPID FIRE, HE HOLDS RESERVE ARROWS IN HIS LEFT HAND

Made without feathers, these arrows take a spiral motion in flight (see, also, illustration, page 295). This warrior is from a village on the Strickland River.

JUNGLE FOLK FLEE AT SIGHT OF PLANE

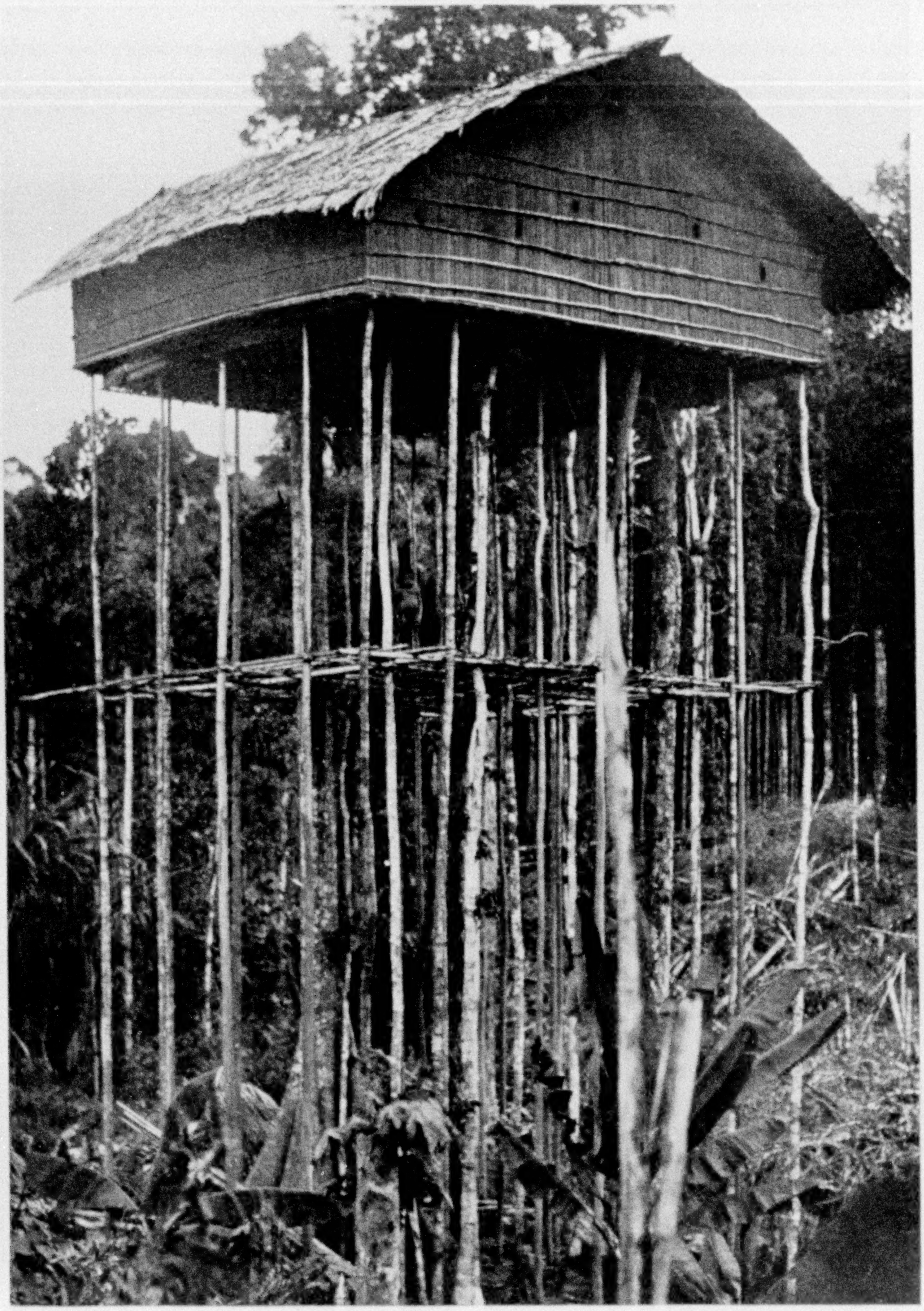
On July 22 we took off for a flight up the Strickland to seek Champion, who had set out four or five days previously with a police detail in a double canoe propelled with one of our twin-cylinder outboard motors. We were concerned for his safety, so we scanned the river en route to Lake Murray, but without locating his party. Later we learned that they were in a narrow channel between some islands when we passed.



Photograph by Dr. J. Jeswiet

A FICUS TREE AT THE EXPEDITION'S BASE CAMP

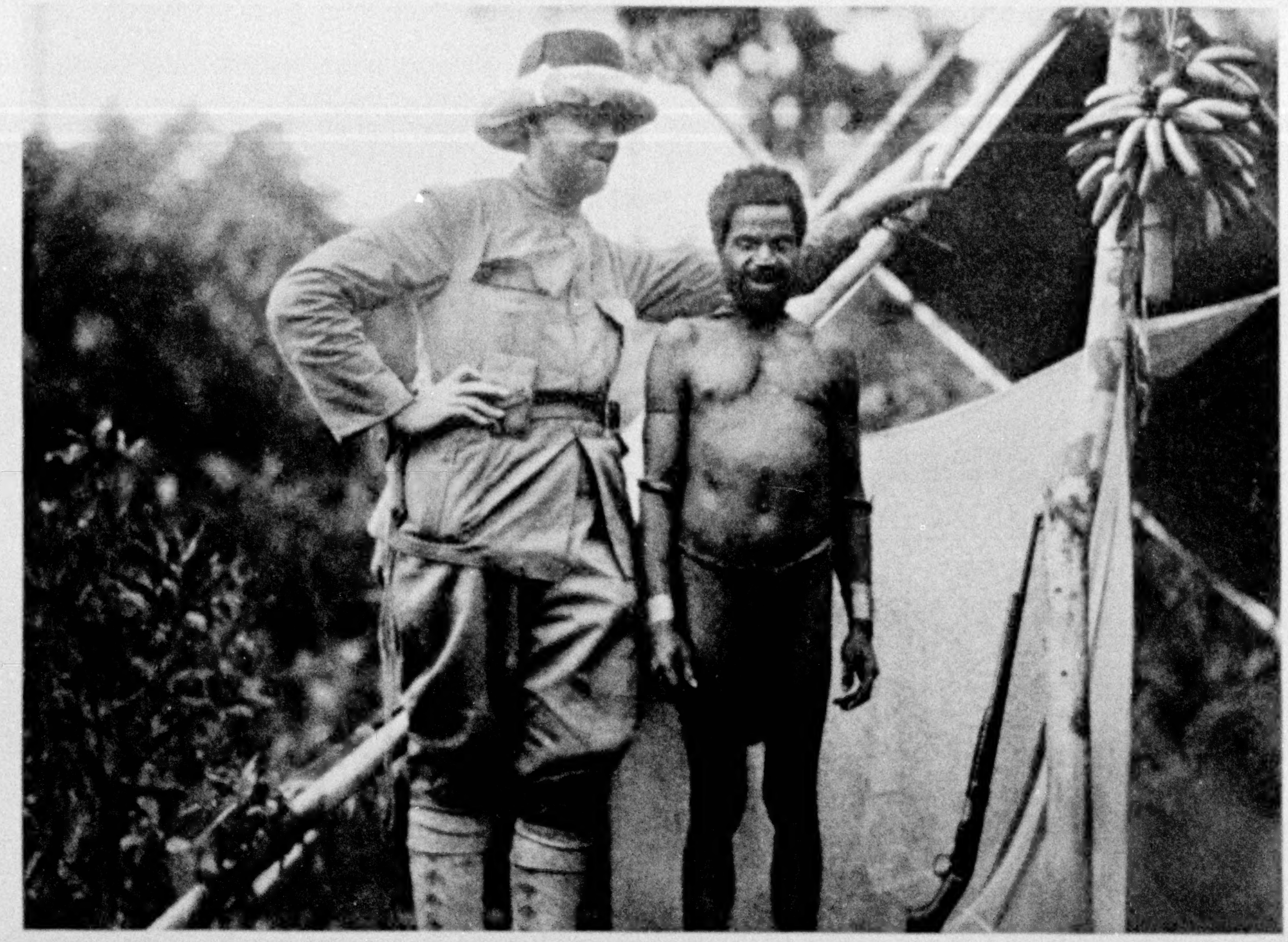
This New Guinea cousin of the banyan and peepul trees, all members of the fig family, is usually the main pillar supporting the houses of pygmy tree-dwellers (see, also, pages 289 and 309). Note the size of the aërial roots, which are sometimes utilized by the pygmies as supplementary supports for their houses.



Photograph by Dr. E. W. Brandes

LIKE HUGE BIRDHOUSES ON POLES ARE THESE PYGMY DWELLINGS

Usually the central support of such a structure is the trunk of a ficus tree (see opposite page), the top of which has been hacked off with stone axes (see page 298). On the halfway platform two small boys are standing. The dwellers are most adept in rapidly ascending or descending by means of a notched pole when danger threatens.



Photograph by R. K. Peck

THE AUTHOR AND A DIMINUTIVE BLACK FROM KATINGOR

The relative heights of the American and the Papuan are not clearly indicated in this photograph; the former was standing on much lower ground than the native, as indicated by the relative position of the knees.

We saw a village with a large community house, on a lake just southeast of Lake Murray, and descended low to inspect it. Its people fled for their lives into the bush.

Continuing, we circled Lake Murray, exploring every bay and estuary for signs of Champion, but without success.

This lake is 40 miles long from north to south, with dozens of narrow estuaries terminating in small streams extending, like the tentacles of an octopus, in all directions. It is a spot of surpassing beauty, viewed from the air, and is the home of a lotus with magnificent pink blooms, about 10 to 14 inches in diameter, and other gorgeous water plants. Endless flocks of geese, ducks, and herons rose from the water beneath us as we passed.

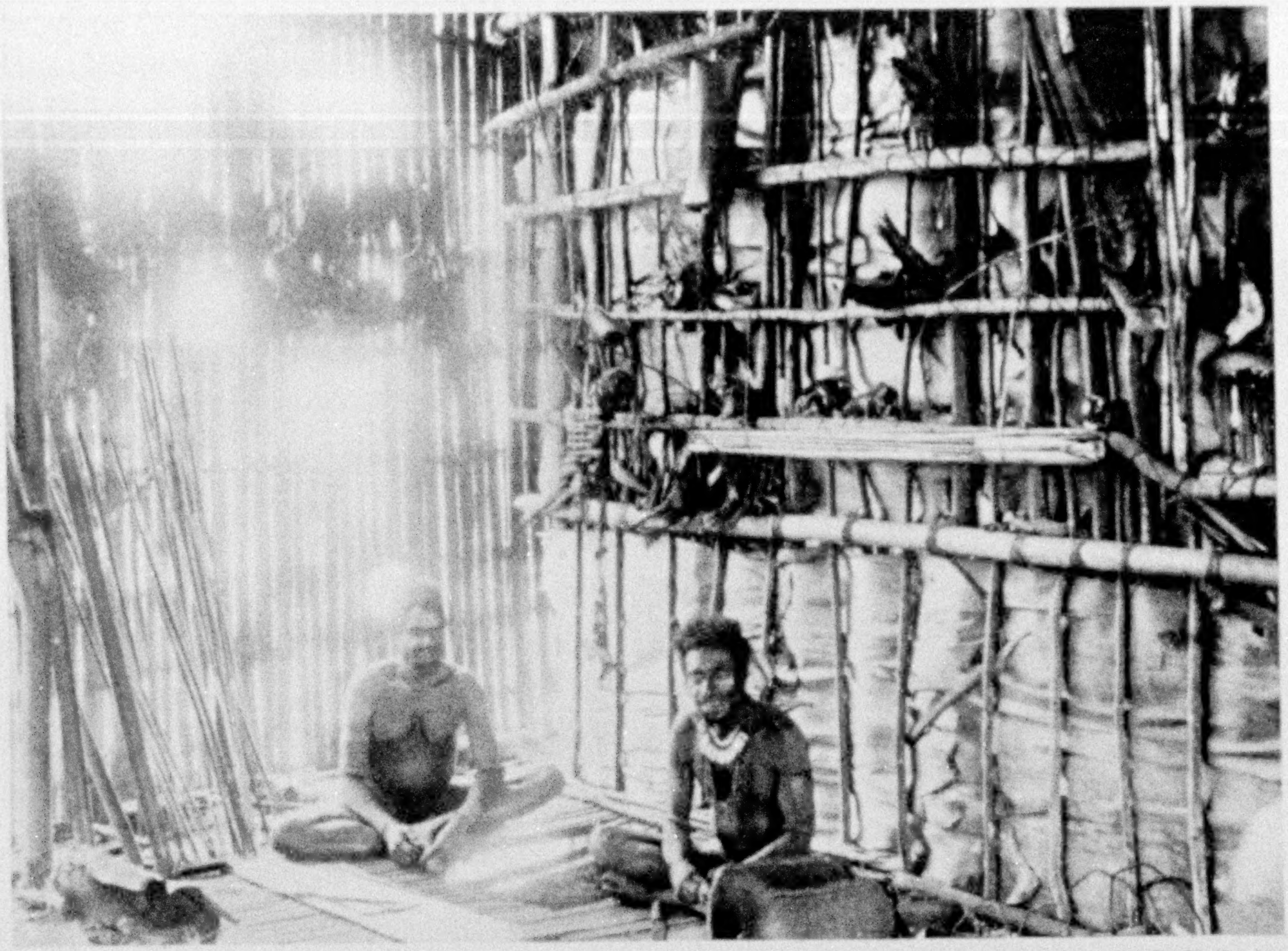
Peck tried to shoot some ducks and we had an exciting few minutes maneuvering to get "on the tail" of the flock.

We saw six villages during our long trip around the lake and had an amusing experience with some natives in two long canoes near an island. Wishing to inspect them at close range, we volplaned down toward them from a great height. But the view we got was only of their feet, as the whole crew jumped overboard!

It goes without saying that we were considered supernatural. All natives of this island with whom white people have been able to exchange ideas of an abstract nature have disclosed strong beliefs in spirits, malignant as well as beneficent. Most of them conceive of ghosts of departed friends and enemies, who must be placated in various ways to avert dire consequences.

A VISIT TO A DESERTED DUBU

Of course, the civilized coastal native becomes reconciled to the airplane very quickly. They now accept the powers of the white man with indifference. After seeing boats that go without paddles or sails, paper that talks, phonographs, etc., they are resigned to the conquest of the air,



Photograph by R. K. Peck

THE INTERIOR OF A PYGMY TREE-HOUSE BUILT 60 FEET ABOVE THE GROUND

To get this picture, Peck, hampered by his camera, had to do some hard climbing. Against the wall at the left are digging sticks, bows, and arrows. Between the two men is a sunken hearth. At the right is a "whatnot" containing arrows, headdresses, and other personal belongings.

and with a shrug put it down as fresh evidence that "white-man fashion" is different from "New Guinea-boy fashion."

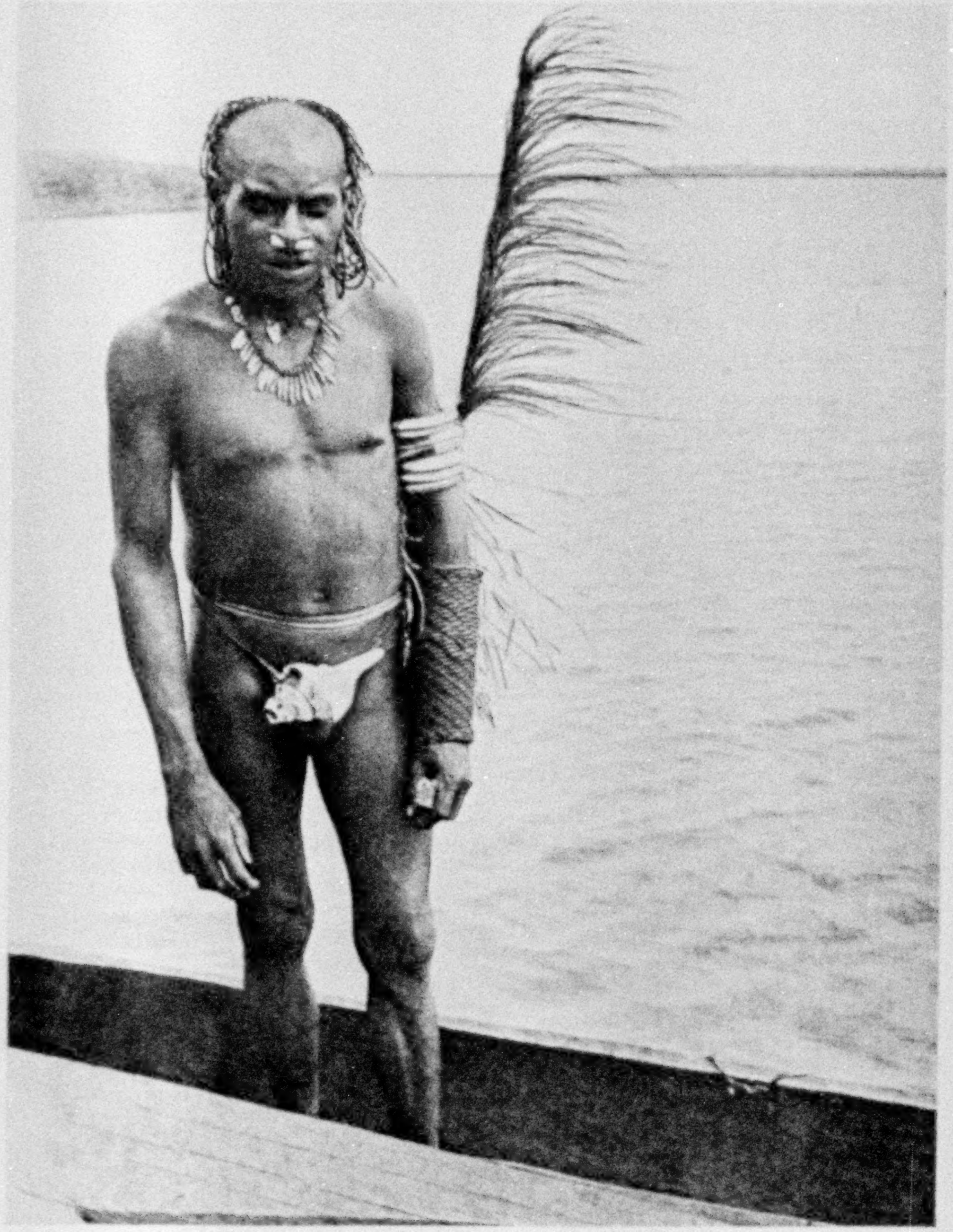
We flew back to the village first seen and descended on the smooth water in front of it. A close-up view disclosed the typical big dubu, or long house, with yawning entrance to a dark interior. Grinning human skulls were arranged on racks just within, presumably a defiant challenge to strangers and a warning of what they might expect if they sought to enter.

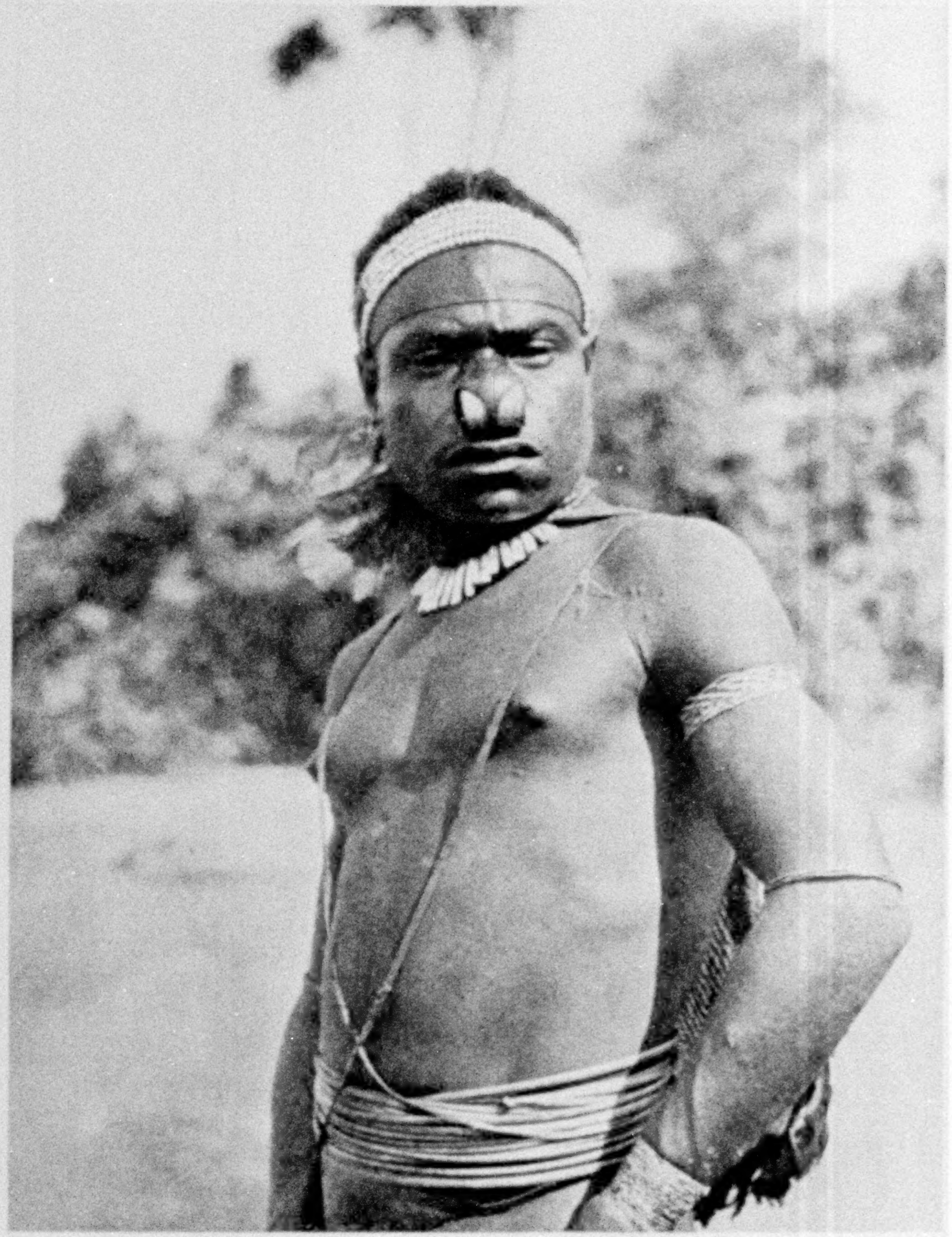
This dubu faced the lake and stood in a thick grove of coconuts and other trees. Several canoes were on the shore tethered with rattan. A narrow path led through a heavy growth of tall Eulalia grass, up the steep bank and across a level space to the entrance. No signs remained of the fleeing natives we had observed when we passed over, but we had an uneasy feeling that we were being observed. Not knowing the character of the reception we might receive, we faced the seaplane into the lake and paddled shoreward tail first.

Upon grounding in the mud, we leaped into the water and walked across the shingle to the high bank in full view of the dubu, shouting in a loud but (as we fondly hoped) friendly tone all the while. There was no answer. Was the silence ominous or did it merely mean that the fierce savages (as they had been described to us) were now far away?

We carried no rifles in our hands. To the primitive man a rifle is a club, and he is thoroughly cognizant of the uses of a club. A pistol in its holster is to him purely ornamental. He has no conception of the sudden death lurking in such a small, innocent-looking package. The principal defense upon which we now relied was a wide smile, and as we advanced we did our best to register pleasure.

Still nothing happened. Did that slight





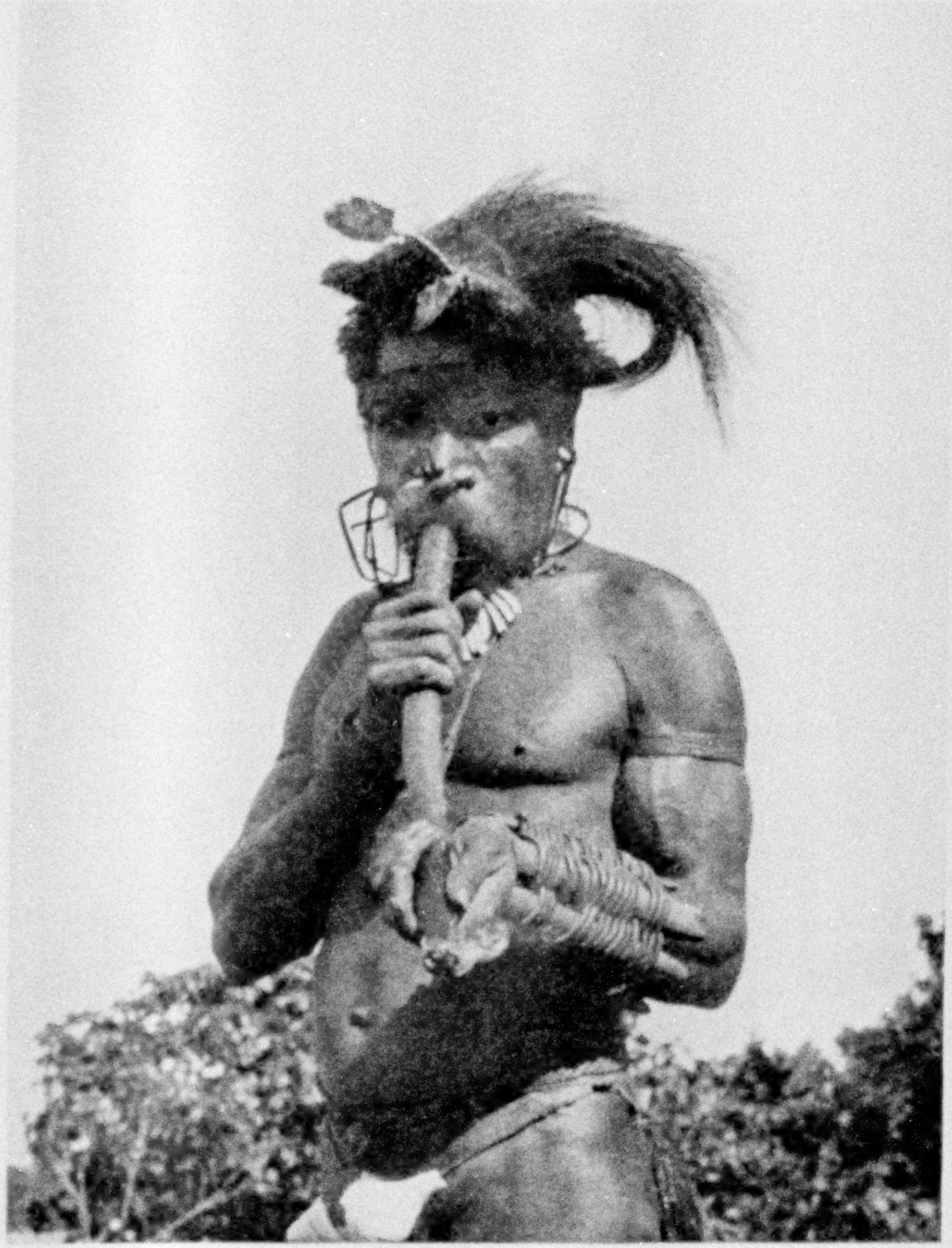
Photographs by R. K. Peck

HIS HOME IS AN ISLAND IN LAKE MURRAY (SEE ILLUSTRATION, PAGE 308)

To protect his wrist against his bow string, he wears a woven rattan guard (see, also, page 293) on the left, or bow, arm. Into this he has stuck a plume of cassowary tail feathers. Around the upper arm he wears armlets of bush pigs' tusks, and his apron is a conch shell.

A KATINGOR PYGMY WEARS HIS FIRE-MAKING APPARATUS AS A GIRDLE (SEE TEXT, PAGE 314)

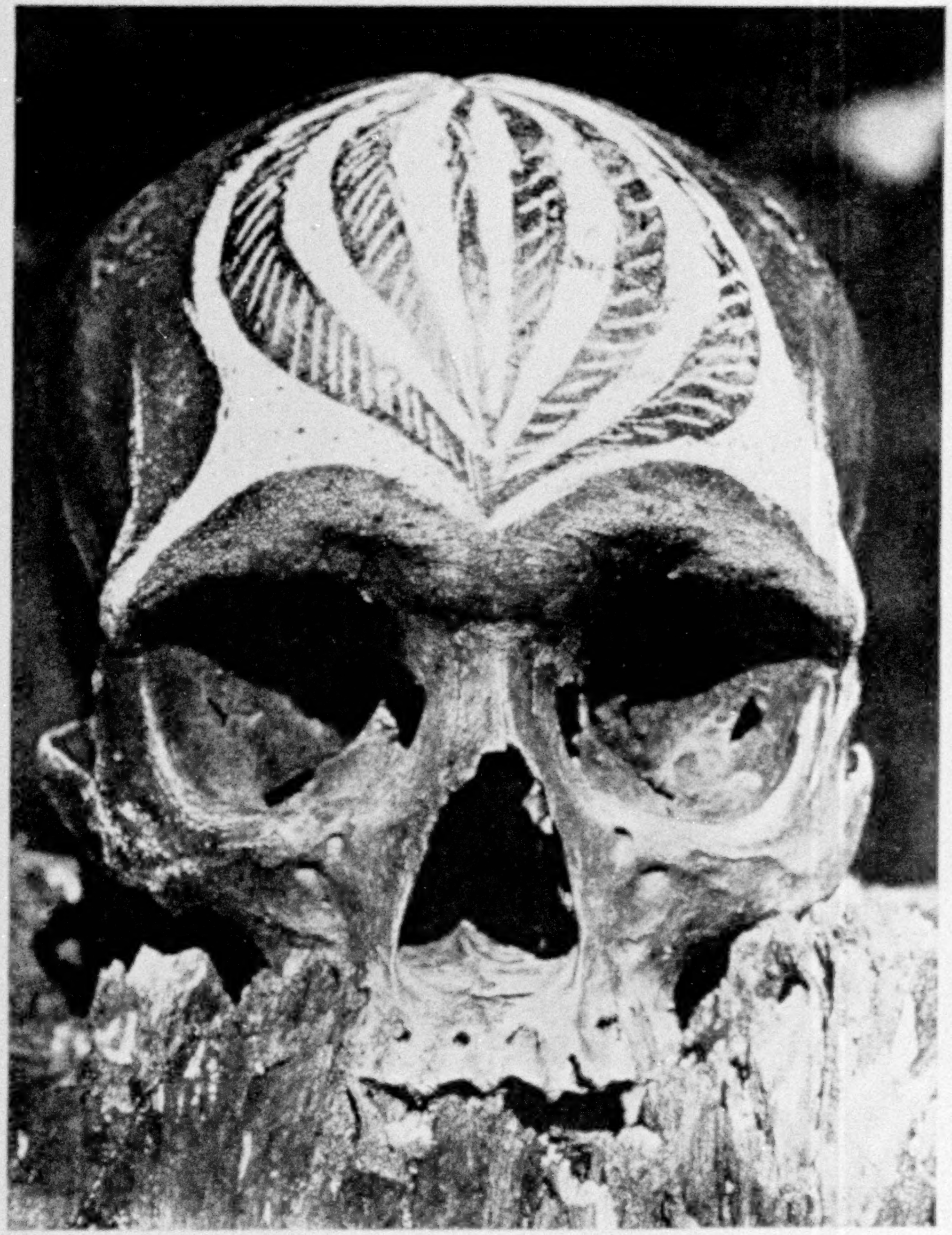
In his nose is the customary bamboo plug. His coronet is made of the seeds of Job's-tears and his necklace is composed of pigs' teeth. Slung across his back is a palm-leaf bag, in which he carries a supply of tobacco.



Photograph by R. K. Peck

A PYGMY TAKES A SMOKE

He wraps his tobacco in a bit of banana leaf and inserts it in this mammoth cigarette holder. He wears the rattan wrist protector (see, also, opposite page). Through the septum of the nose is thrust a bamboo plug, and through the skin of one nostril protrude the claws of a flying fox. From his ears hang quills of the cassowary and the plumage of that giant bird forms his headdress. His necklace is made of pigs' teeth.



Photograph by Dr. J. Jeswiet

A PAINTED TROPHY OF A HEAD HUNT

Skulls are much used in the arts and rites of New Guinea tribes. Not only the bones of enemies but also those of deceased relatives are employed for many purposes. Among some tribes a widow wears her departed husband's thigh bones as a collar around the neck or as "panniers" about the waist. This skull is mounted on a post in a pathway near the dubu at Miwa (see page 294).

Photograph by Dr. J. Jeswiet

SKULLS ON POLES GRIN FROM JUNGLE NOOKS

In this cannibal country such grim trophies confront one suddenly from the least-expected places. This specimen (see, also, page 293) is mounted on a post back of a crude stile leading to a village garden.

movement of grass on our right mean a lurking warrior? It seemed wise to wait a bit.

A PAINTED SAVAGE LEAPS INTO THE OPEN

We continued to shout and at intervals to advance step by step. And we got slight comfort in the thought that we were covered by those remaining in the plane and would be quickly revenged if speared.

The suspense was wearing. Could that movement in the grass be merely the wind, after all? No, sir! Positively, it was not! For now a painted individual suddenly leaped up, not 15 paces away, and emitted a startling string of gutturals, accompanied by violent gestures.

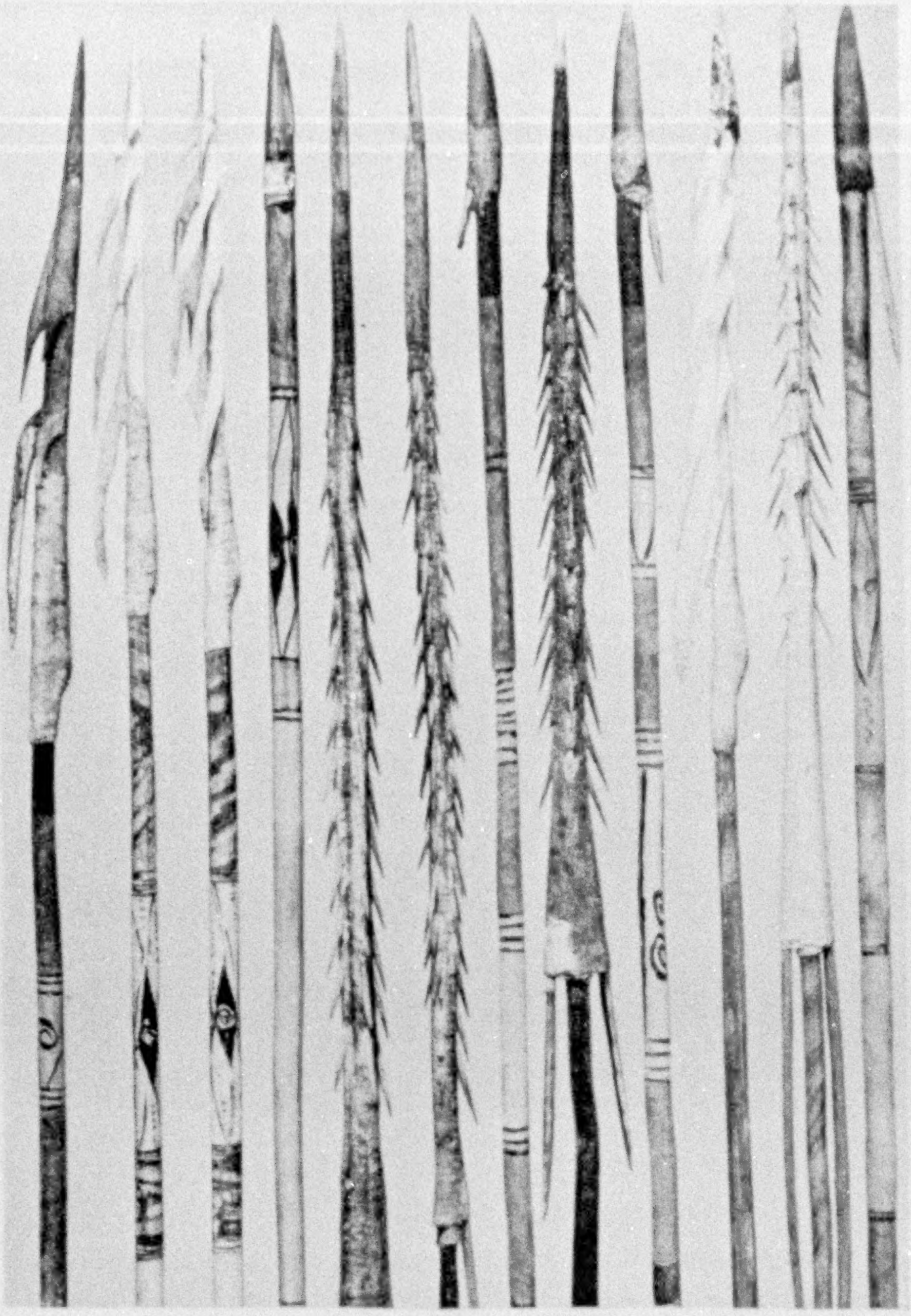
He was bearded, clothed only with a shell, and was emotionally aroused. A series of advances and retreats now ensued, as I attempted to make contact with him to present a piece of turkey-red calico. Peck meanwhile sought to make a deathless film record of our first meeting with the renowned head-hunters.

Soon this first aborigine was joined by

six others. They were all in a great state of nervous excitement. They would not permit us to approach near to them, but kept up a continuous jabber, accompanied by long-drawn-out whistles, exactly as we do when too overcome by wonder to speak. Thirty or forty minutes elapsed after the time of landing before I was able to hand the enticing flame-colored cloth to a bearded patriarch and give him a reassuring pat on the shoulder. From this he cringed and dodged away.

Pemberton now found a short length of chewed sugar cane on the beach and made signs that we wanted food. Immediately there was a dash to the rear by most of the score of savages now assembled, and soon they returned with armfuls of cane. A brisk bartering took place and soon we had good specimens of six varieties of cane.

This business calmed the crowd, which now numbered 30 or 40; but most of them kept a safe distance away. Several venturesome spirits, with the brave man who first appeared, grew bold enough now to touch our khaki clothing. They whistled as before and exchanged confidences in amazed tones. I was startled when one cannibal calipered my leg in a professional manner and otherwise conducted himself like a judge in a stock show.



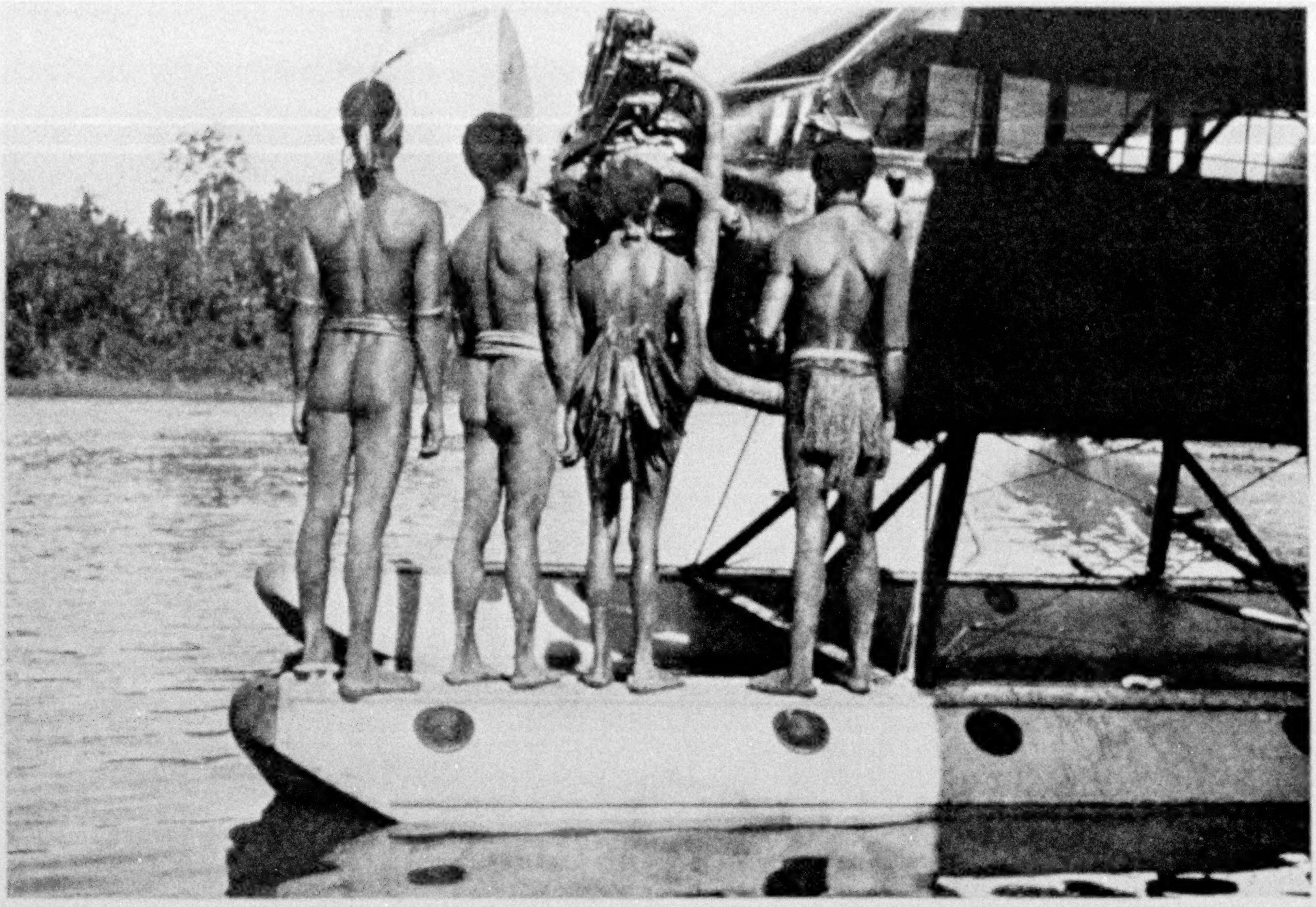
Photograph by James F. Brewer

AN ASSORTMENT OF ARROWS COLLECTED IN THE MIDDLE FLY RIVER DISTRICT

These weapons are tipped with carved cassowary breastbones and cassowary claws and are barbed with spines from the dorsal fins of fish or porcupine quills. The shafts, made of stems of Eulalia and wild sugar cane, are not feathered; consequently the flight of such arrows is winding and confusing to the human target, but true to the mark (see, also, text, page 298).

STUFFED HUMAN HEADS OFFERED IN TRADE

Now the leading spirits among them began to bring out trophies. These included their most prized possessions — *stuffed human heads!* They indicated a desire to exchange them for the trinkets we displayed. Fishhooks, safety-razor blades, empty cigarette tins, and colorful cloth captivated them, and they seemed to consider a hinged flat tin the equal of any of their possessions. We had been cautioned against wholesale traffic in heads, as it might stimulate the local business of taking them. It was interesting to note, however, that for a mere trifle, in our estimation, a warrior would part with these



Photograph by R. K. Peck

WHEN THE PLANE HALTED AT THE JUNCTION OF THE FLY AND OK-TEDI, NEGRITOS VENTURED ABOARD

mute but ghastly evidences of his prowess. We did not see them cut off any heads or dress them, but we understood the pantomime with which they endeavored to convey to us the method.

One grinning savage complacently related with obvious relish how he had made away with the man whose remains he now used realistically to punctuate his remarks. It was an ambush, evidently. We could piece together the story readily enough on perceiving that the blow was struck behind. Most of the skulls testify to this.

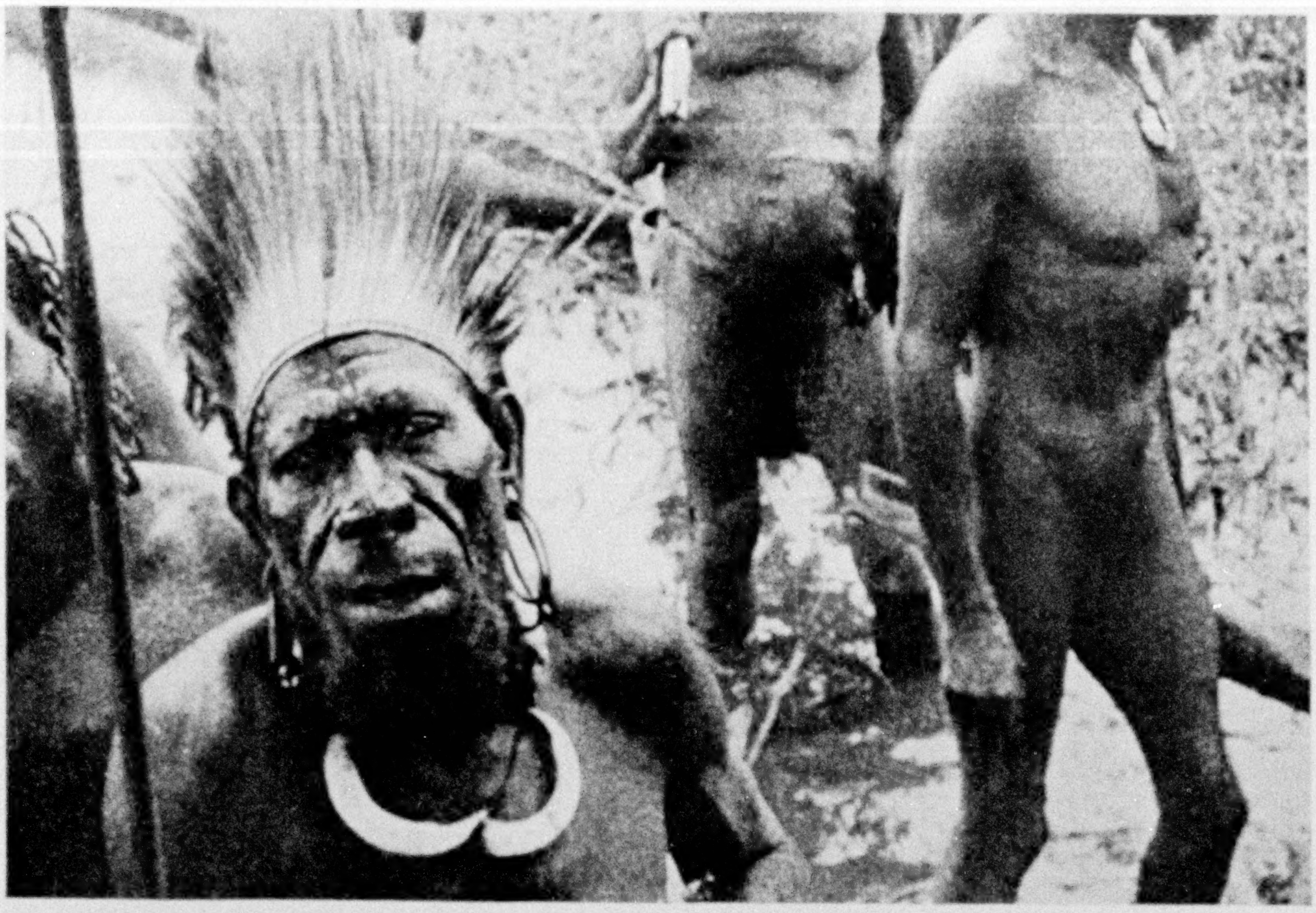
After the arms of a victim have been cut off, the body is partly severed near the middle and the skin worked up over the head, like pulling off a sock. The vertebræ of the neck are next dislocated by a violent side jerk and the head cut off. The brains are removed through holes in the skull, and all adhering flesh that can be conveniently scraped off is also removed. The armholes are darned with thongs and the drying and curing process is accomplished by smoking over a fire.

The stuffing material is coconut husk fiber and clay, a large lump of which protrudes from the open mouth, making the victim look as if he had choked on a baseball (see illustration, page 330).

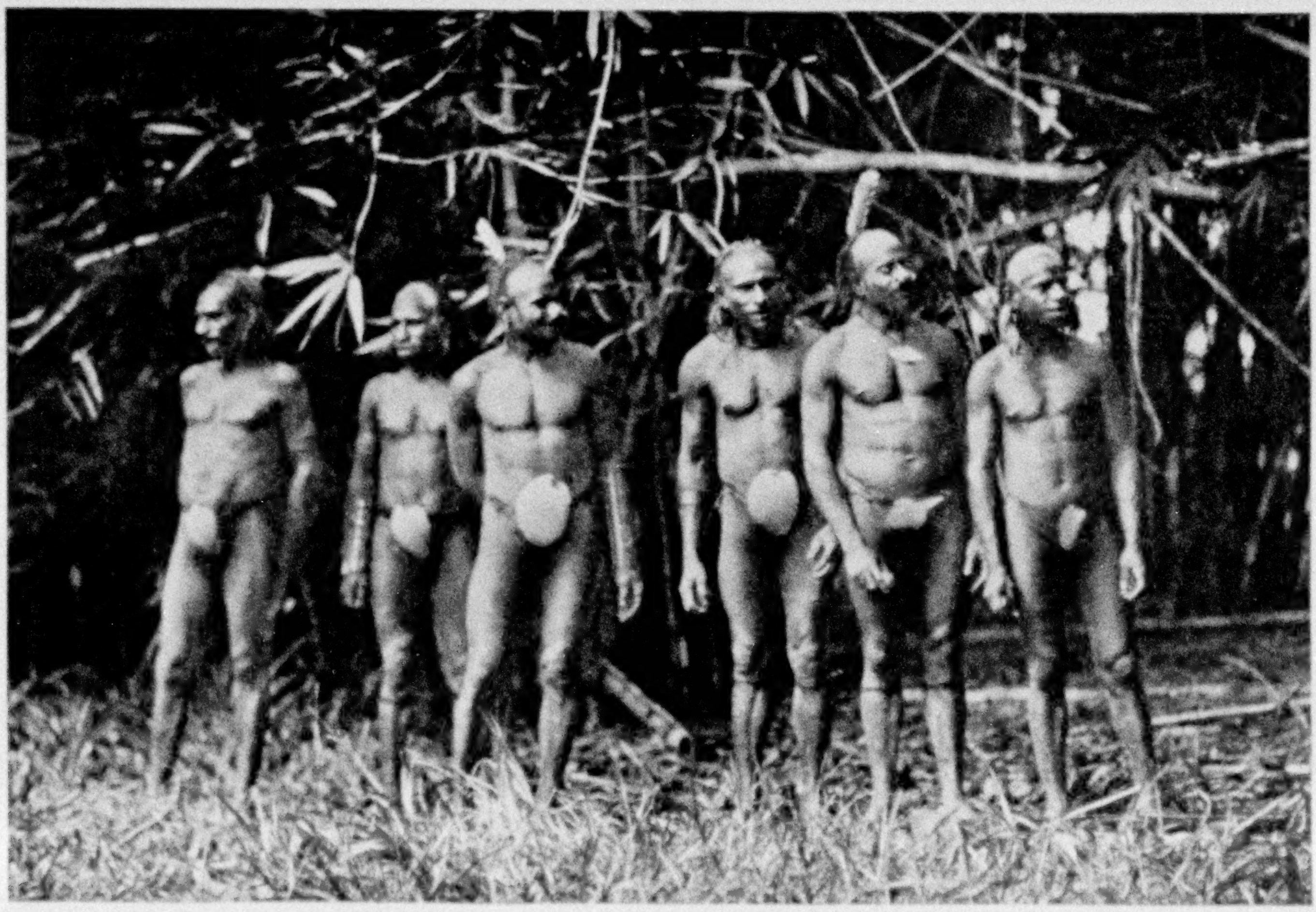
By stuffing it with mud a head is enormously distended longitudinally, until it resembles a horse more than a human being. The skin of the nose is cut in strips and braided, being fastened again to the upper lip, where, reinforced with a loop of rattan, it serves as a convenient handle for carrying the trophy. The finished product on the constricted pedicel-like torso is now ready for display or use in the childish diversions of these primitive folk.

Certain parts, our informant continued, are quite delectable to the palate.

As to the continuance of cannibalism: Many areas are not yet under Government influence, and where cannibalism has existed for thousands of years it still persists. The Papuan follows the precept and example of his forbears. Head-hunting is not an everyday affair, yet many of the people of the interior probably meet their fate in this manner. Much time may intervene between head-hunting raids on a wholesale scale, but the native seems to give a good deal of thought to cannibalism at all times, and it is noteworthy that the



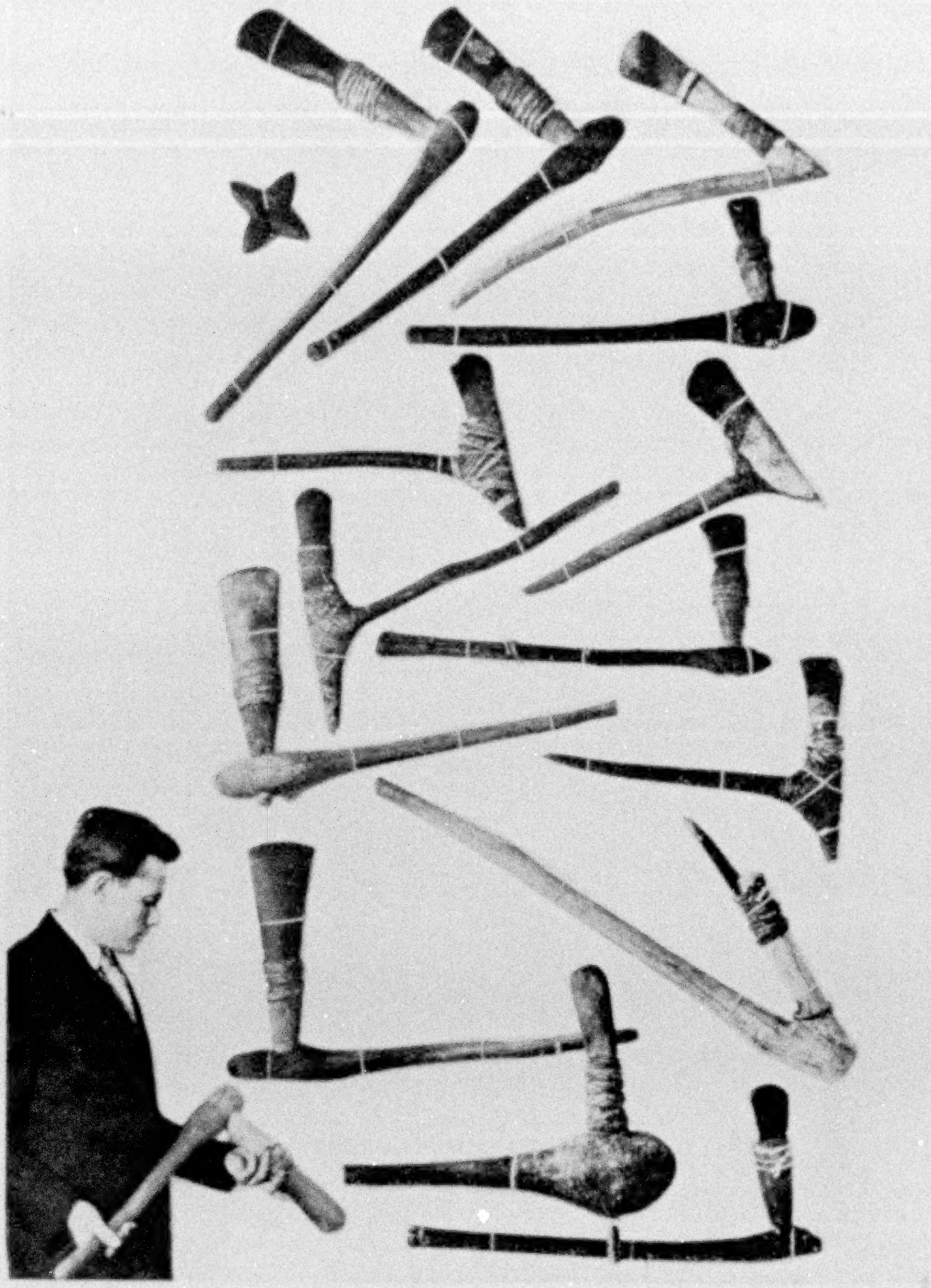
THE HEADDRESS OF A LAKE MURRAY NATIVE, MADE FROM BIRD-OF-PARADISE FEATHERS



Photographs by Dr. E. W. Brandes

PERFECT PHYSIQUES DISTINGUISH THESE NATIVES OF THE FLY RIVER PLAIN

It took much persuasion to keep the head-hunters in line and quiet long enough to be photographed. Although they live 300 river miles inland from the ocean, their large white aprons are made of sea shells.



Photograph by James F. Brewer

THESE STONE AXES HAVE SHAPED MANY A NEW GUINEA CANOE

Among the trophies brought to the Smithsonian Institution in Washington, D. C., by the author is this unique collection of weapons and implements. At the upper left is the head of a star club, used to give the final fatal blow to a victim. It comes from the Strickland River region. The axes have blades of smooth green stone of razor-edge sharpness. They are attached to the handles in such a way as to enable the user to change the angle of his blade at will by merely shifting the position of a wedge.

middle and upper Fly natives are never seen without their arms.

COLLECTION OF BOWS AND ARROWS BROUGHT TO SMITHSONIAN

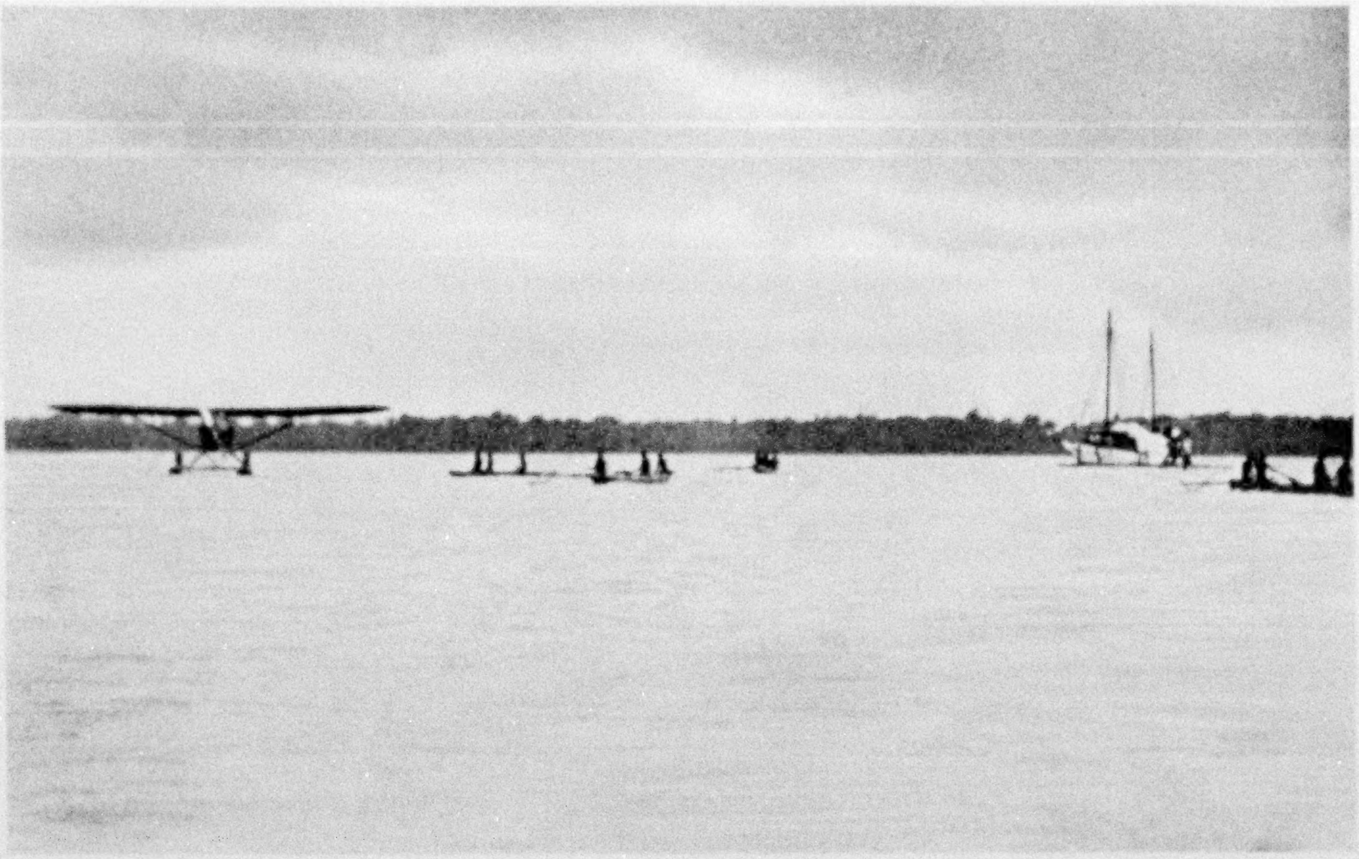
We obtained many weapons here for the Smithsonian Institution at Washington. The bows are of split bamboo, quite unlike the black palm bows of the Delta. They are about three inches wide and seven to eight feet long and are bent with the hollow side out. The bowstring is a flexible strip of split bamboo. Such a bow in the hands of a well-built savage will drive an arrow more than 200 yards.

The arrows used by these folk are masterpieces of fiendish creation. Those used for fighting are tipped with the long, straight claw from a cassowary toe, or bones from the wallaby, cassowary, or pig. Most of them have recurved barbs of bone fixed to the shaft with fiber and gum, so that the arrow cannot be withdrawn (see illustration, page 295).

The tips of some arrows are eccentric, and it follows that when they hit an obstruction they are deflected and cannot be pushed through. The result is that the filthy point, which may have been steeped in decaying meat, remains inside and sets up septic poisoning; so, if the victim does not bleed to death shortly, he is doomed anyway.

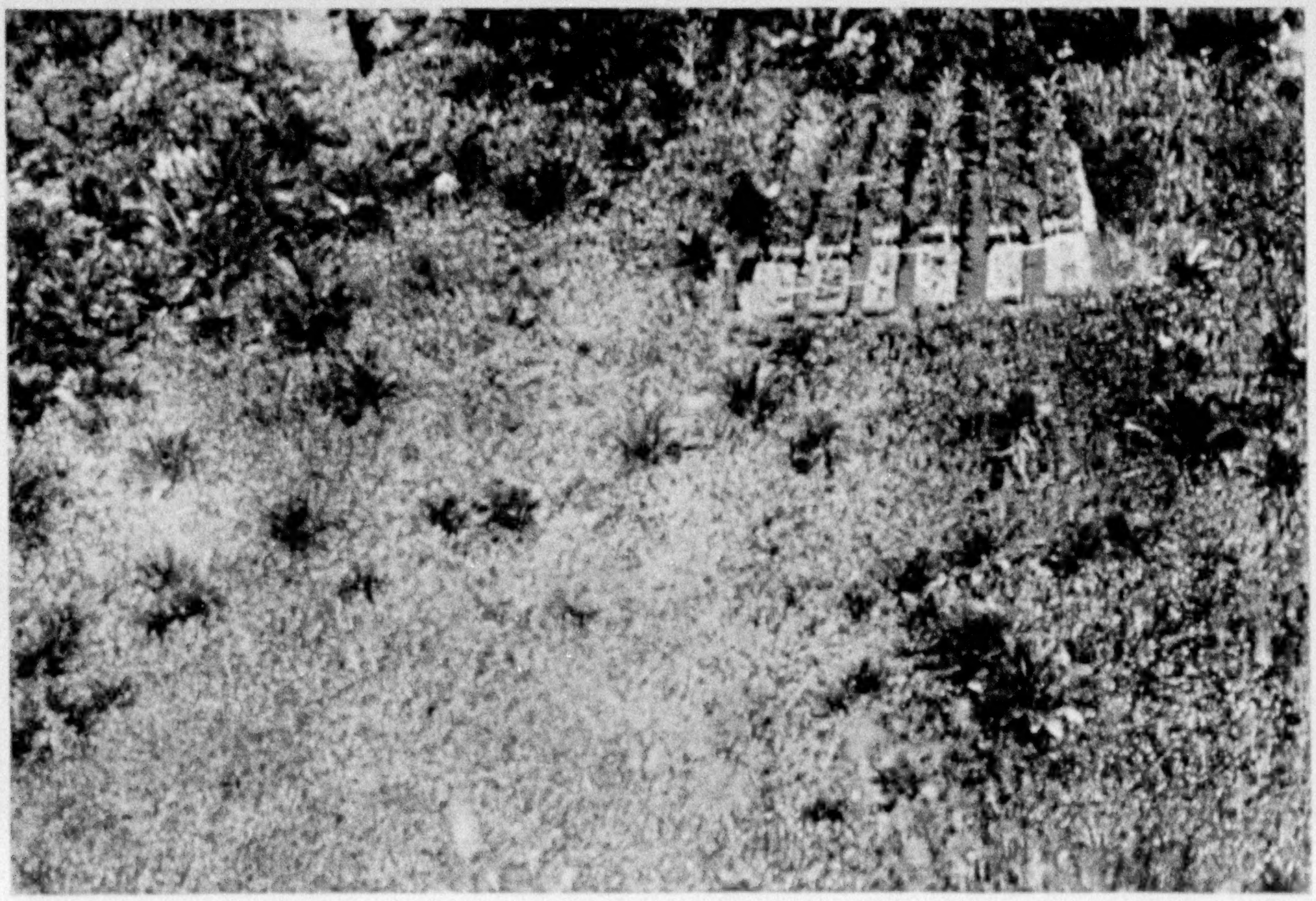
The long points made of cassowary breastbone are carved in a series of jagged, recurved barbs two to four inches long.

The most diabolical arrow of all is provided with bone tip and a hundred or so straight barbs, made of porcupine quills or spines from the dorsal fin of fish, extending in bristling array for about 15 inches back from the tip. They are set in a sort of cement that may be hardened latex of some tree. Hunting arrows are pointed with bamboo bayonets or slender, beautifully turned pencils of black palm



THE SEAPLANE ALIGHTS IN THE FLY RIVER FOR MORE FUEL

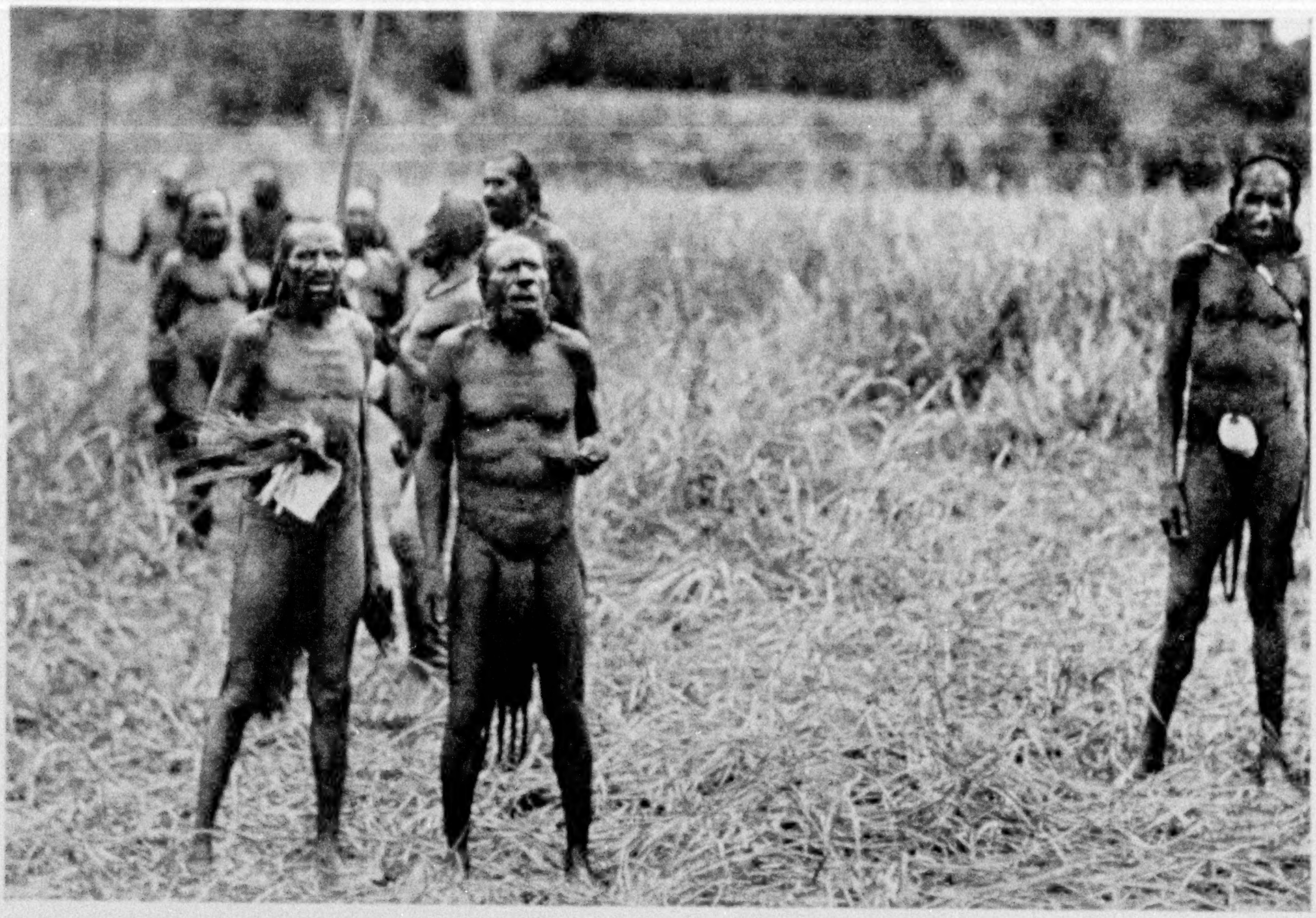
After a record flight, the aviators, with gasoline tanks practically empty, were contemplating a forced landing when, by happy chance, they sighted the Expedition's supply ship *Elevala.*



Photographs by Dr. E. W. Brandes

A FLY-RIVER GARDEN PHOTOGRAPHED FROM AN AIRPLANE DURING A TROPICAL RAIN

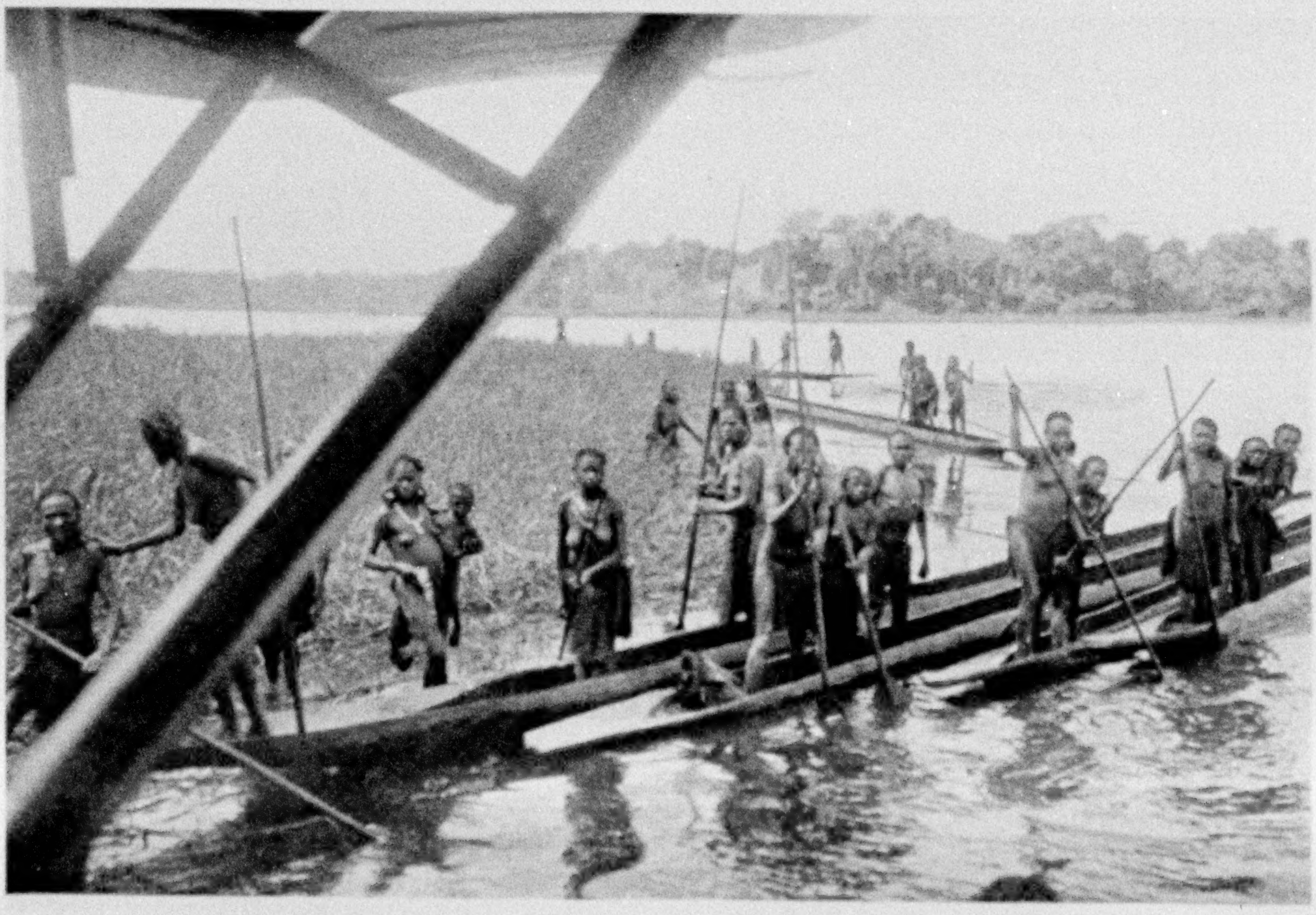
At the upper right are rows of banana plants growing on ridges separated by drainage ditches six feet deep. The white rectangles are parts of the ridges which have not yet been planted or upon which are growing immature banana plants. The drainage ditches are so deep that the natives place logs (the white sticks) from ridge to ridge to enable them to cross.



Photograph by Dr. E. W. Brandes

REGISTERING CONSTERNATION AND AMAZEMENT

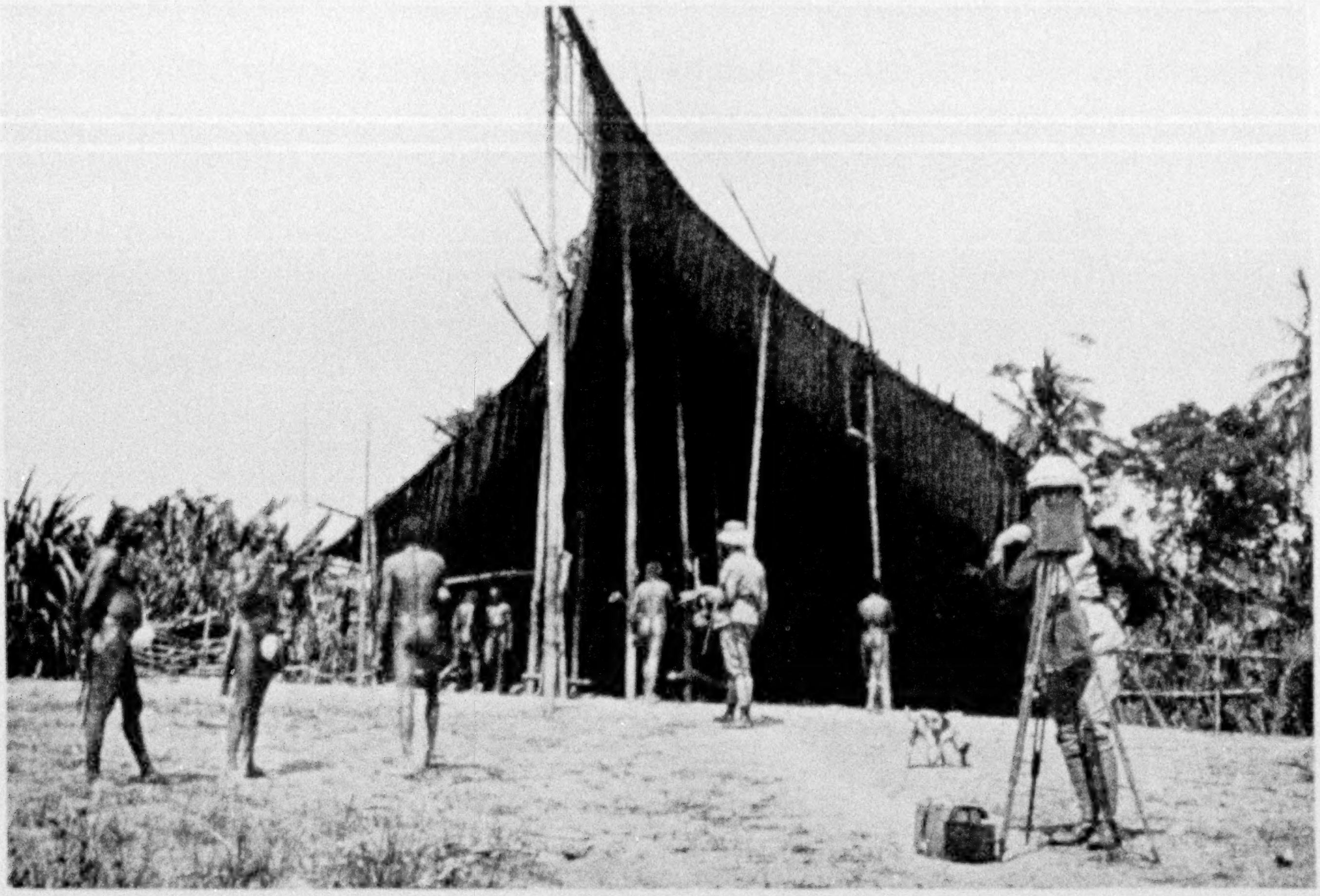
The expressions on the faces of these Lake Murray savages are due to the fact that, for the first time, they have just seen an airplane descend and a white man climb out of it. The man at the left holds a bird-of-paradise plume.



Photograph by R. K. Peck

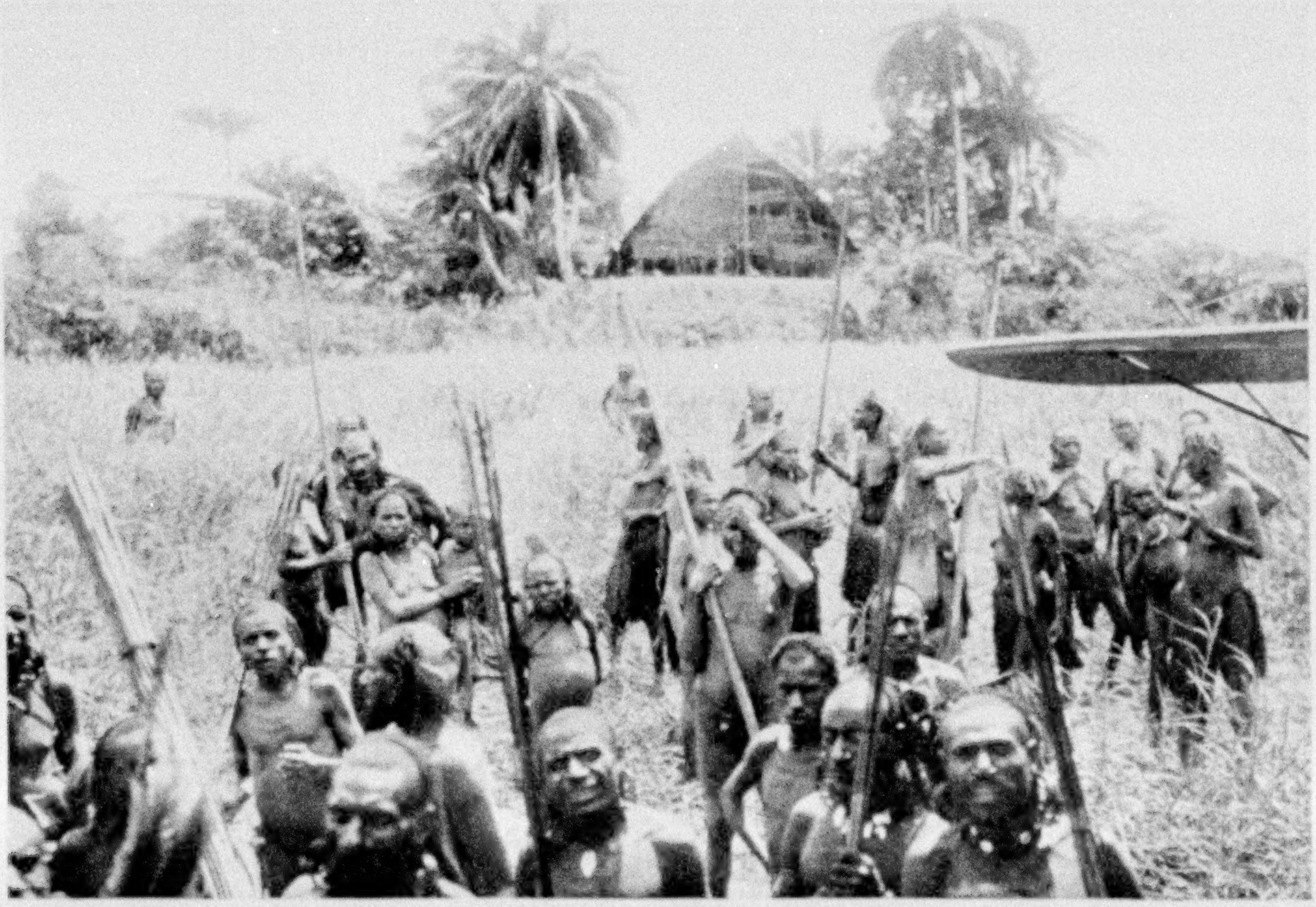
WHENEVER THE PLANE ALIGHTED, NATIVES HURRIED TO SEE IT OR FLED FROM IT

In dugouts these Lake Murray savages swarmed up to see the "big hawk." When women and children arrived with the warriors, the members of the Expedition felt relatively free from attack; when there were prospects of hostilities, the men kept their families in the background.



THE DUBU HOUSE IS TABU AGAINST ALL WOMEN

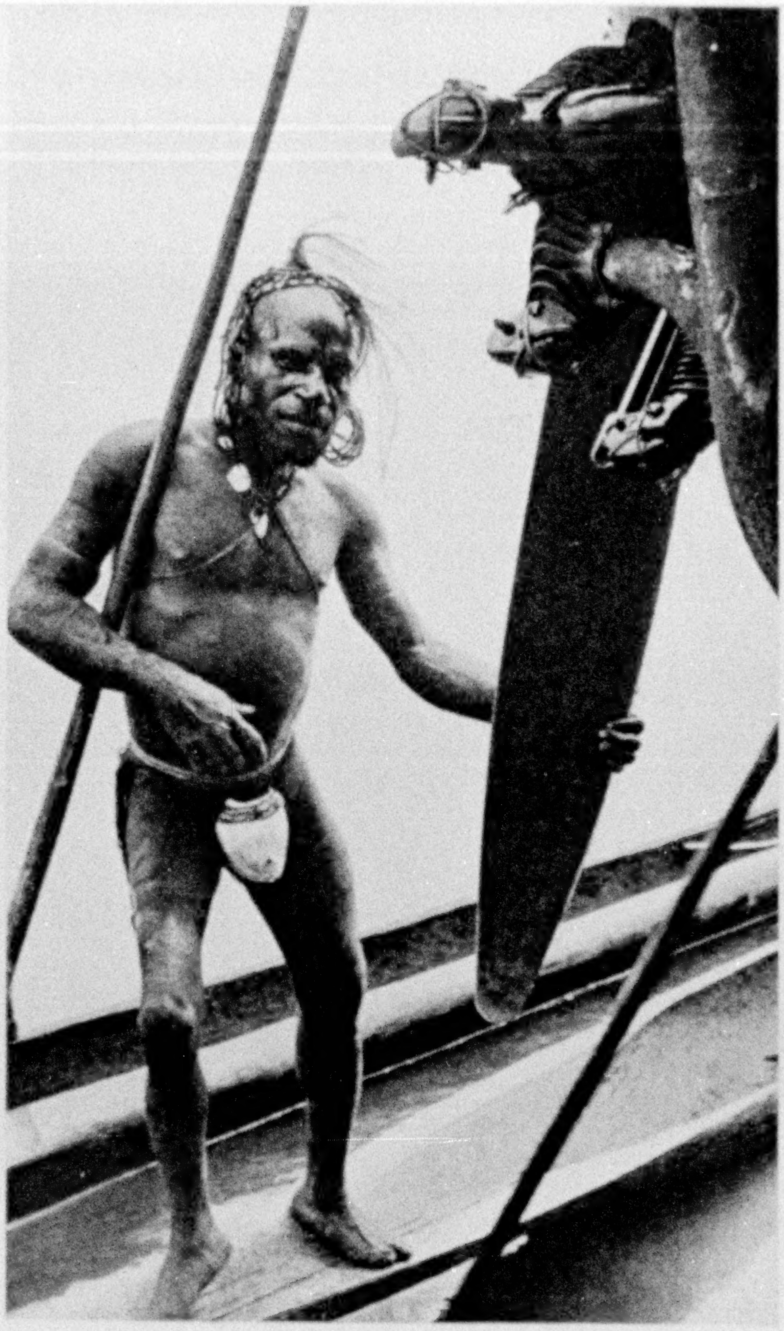
The odd structure, for men only, stands in a village on a small body of water near Lake Murray. The town had never before been visited by whites, and throughout the Americans' stay the natives were in a state of nervous excitement.



Photographs by R. K. Peck

ARMED CANNIBALS, VISIBLY EXCITED, GET THEIR FIRST VIEW OF WHITE MEN

The spearmen are from an island village near the east shore of Lake Murray. In the background is a dubu, or council house (see above, also, text, page 290). At the right is the wing tip of the author's plane.



Photograph by R. K. Peck

A LAME NATIVE EXAMINES THE AËRIAL VISITOR

He bears many frightful scars, apparently from cuts in battle. The aged, the lame, and the halt were seldom seen in New Guinea; apparently they are unable to survive the continual warfare and raiding for heads.

and other wood. All arrows are shafted with straight jointed stems of tall grasses, including *Miscanthus sinense* and *Saccharum spontaneum*, a wild sugar cane.

Axes and adzes for cutting down trees and making canoes resemble in shape our steel axes and are generally made of the same material as the clubs, a smooth, dark-green stone (see page 298). A dirk made from the femur of the cassowary is common, the double-knobbed end, where it is articulated with the pelvic bone, making a convenient handle.

These natives gave what we considered evidence that they had never seen white men before. Their fright and amazement and their willingness to part with possessions of value for little or nothing in return were in great contrast with the attitude of the inhabitants of villages on Lake Murray proper, who quickly became insolent and "cheeky."

We later visited seven or eight other villages on Lake Murray and on the other lakes and rivers in the vicinity. Lake Murray has been visited a half dozen times since it was discovered, in 1913, mostly by Government parties, and we found the natives there to be so sophisticated as to demand "zingy-zingies" in trade for stalks of sugar cane or their other trifles. With the help of their pantomime, we interpreted "zingy-zingy" to mean a trade ax.

WOMEN OF THE INTERIOR SEEN FOR FIRST TIME

We were much amused by the grave antics of one Lake Murray man, who sought to express his desire for a mouth organ. He blew violently into a discarded cartridge box, with its neat double row of small square compartments, and sawed it back and forth between his lips.

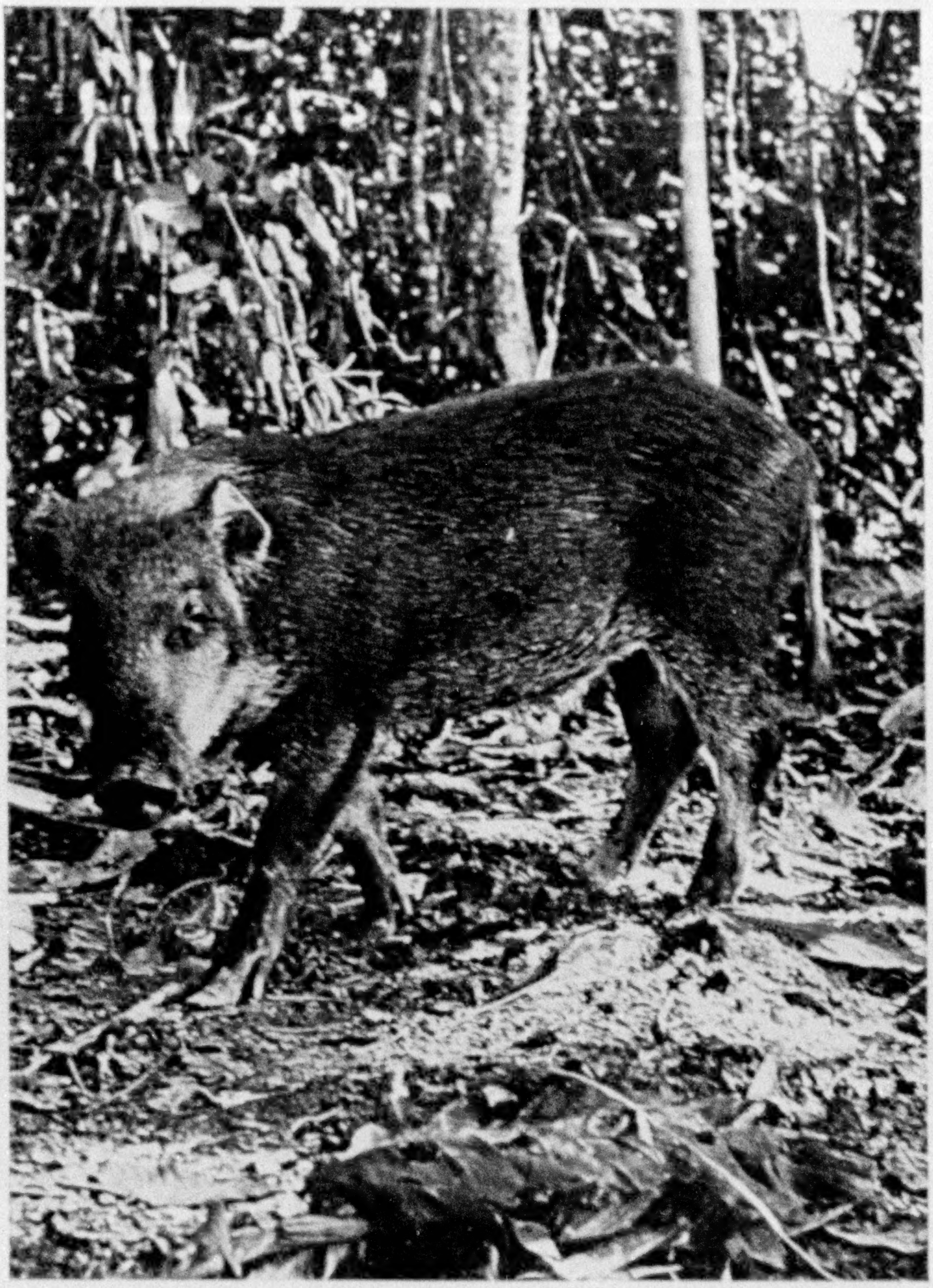
These people were extremely curious to examine the interior of our plane. They crowded onto the pontoons in such numbers that I had to push them violently into the lake several times. A man afflicted with a repulsive skin disease concluded I was playing a game, and upon my pushing him back into the water with the admonition, "Get down, get down," he would repeat, "Gedahn, gedahn," and thereupon get up!

At this place we saw women for the first time in the lake region. Heretofore women and children had been kept back in the bush during our visits, a cause for apprehension, it has been related, as the women are always bundled off when violence is expected.

The women we now saw were scrawny, forlorn creatures, not at all like their men, who are in general stalwart and well-muscled, some being really fine physical specimens. Moreover, the men of this region carry themselves like masters of the earth. They have a confident, self-assertive air that was strongly impressed upon us, after having seen the poor slinking, cringing creatures in some other areas. They frequently have aquiline, high-bridged noses, thin lips, and a decidedly Semitic cast of countenance.

The women came close and the men, not relinquishing their more advantageous positions, crowded still closer and jostled us.

And here we met the genuine essence of Papua! The odor of these people approached the variety encountered in the cathouse of the zoo in winter. One of the women was nursing a small pig. This is a common practice, as the hunter has no recourse but to turn piglets over to his better half to suckle when he kills the mother in the bush.



Photograph by R. K. Peck

THE VORACIOUS PAPUAN BUSH PIG

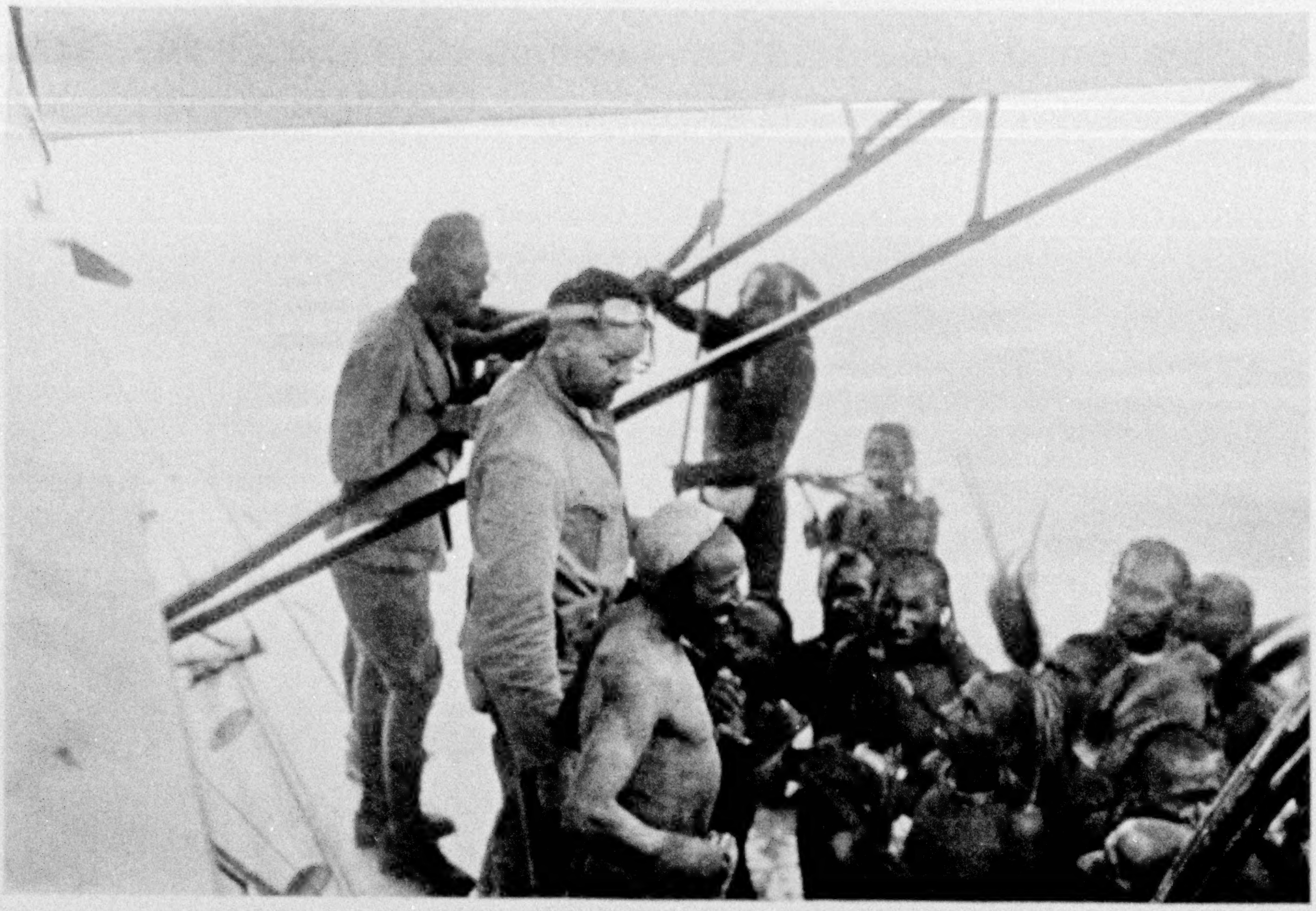
This wary animal, though now numerous, is not indigenous to New Guinea; it was probably introduced centuries ago by those roving mariners, the Polynesians.

EXPEDITION MEMBERS ARE INVITED TO A "SAMBI"

At one village the men were very insistent that we join in a *sambi,* which we took to be a dance of some sort, and in a suggestive manner indicated that there would be provided dusky partners. Although sorely tempted to make observations on the more intimate social customs of these strange beings, we declined, as it is generally assumed that these rites often have for their purpose the betrayal of strangers, natives of course, who are enticed by seductive promises.

At the word sambi, all of the men burst into a chant with not unmusical voices. There was no melody and no harmonious chords made up of notes of different pitch, but simply a long-drawn-out "O-o-o-oh" in unison, like a complete symphony orchestra tuning up following the sounding of a keynote.

During this performance the strong jaws and even white teeth of many individuals were much in evidence. Betel nut is chewed here, as in most other parts of New Guinea, but it either does not result in discoloration of the teeth to the extent noticeable elsewhere, or there are many total abstainers.



Photograph by R. K. Peck

LAKE MURRAY NATIVES FLOCK ABOUT THE PLANE TO BARTER

The man in the foreground, wearing a woven cap, persisted in climbing upon a pontoon. Again and again the Americans pushed him off, but he took it good-naturedly and seemed to think it a game (see text, page 302).

Our interesting first visit with the head-hunters was terminated by approaching darkness, and we gathered our bundles of sugar cane, ethnological and botanical specimens, and cameras and stowed them in the plane. As we made these preparations and untethered the winged steed, there was a prompt movement backward on the part of the natives, and a frank expression of mistrust again appeared in their faces. Peck "gave her the gun" and, as the roar of our 425-horsepower motor split the tropical air, our cannibal friends rushed up the bank and took headlong flight into the bush. A mere handful remained in sight as we flew away.

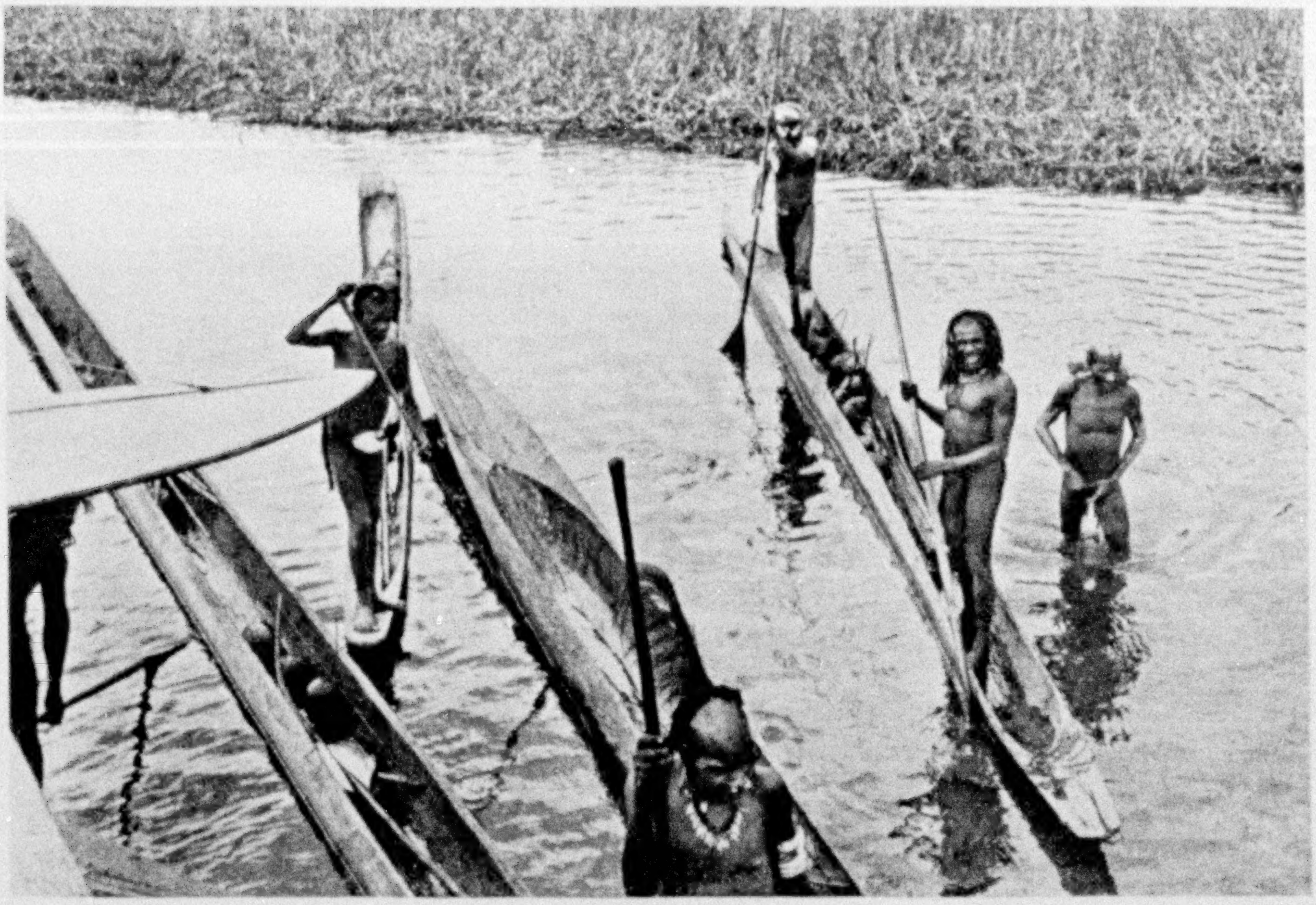
Study of the natural history of New Guinea is a job for specialists, and the field is a fertile one. Primarily, of course, we came for cane; yet, important as that quest was, it was only natural that the strange tribes we bartered with were even more interesting than the plant life we found.

The next area we visited forms a quite distinct entity geographically, with sharp differences in its flora and other natural features. Its inhabitants comprise a group well defined culturally and racially quite unrelated to those previously met. I refer now to the region of the upper Fly River and its tributaries, the Ok-Tedi, Palmer, and others.

A VISIT TO REMNANTS OF A VANISHING RACE

Here the people are Negritos, one of the remnants of a vanishing race. They must be of great antiquity, for they survive in isolated racial islands in New Guinea, Africa, the Philippine Islands, and a few other places.

These diminutive, likable people must be regarded with compassion. With the advance of civilization and the gradual surrender of their territory to more aggressive and enterprising races, they will assuredly perish, for they are physically and mentally unfit to compete in any modern economic order of society. Their free ways of life differ so from plantation routine that it is hard to see how they can



Photograph by Dr. E. W. Brandes

FROM HUGE LOGS THE LAKE MURRAY SAVAGES HEW AND BURN OUT THEIR LONG, NARROW CANOES

fit into any future activities, even in an agricultural or pastoral country. They may hybridize with other races; indeed, they have to some extent in this region; but their identity as a race will be lost unless a preserve is staked out for them in which to carry on essentially as they are now.

We left camp on July 24 to collect cane in the pygmies' land. Peck, Champion, and I formed the party.

Following the Fly in a northwesterly direction, we saw scores of lagoons and lakes bordering the river for the first 20 miles above Everill Junction. From an altitude of 7,000 feet, we saw a vast plain broken by Lake Murray and other lakes to the east and numerous sizable lakes to the northwest, which are not shown on any published map. Lake Murray, 40 miles long, was the largest lake then in our range of vision (see, also, text, page 290).

AMONG THE PYGMIES WHO DWELL IN TREE-TOP HOUSES

About 100 miles by river above Everill Junction the country becomes rolling and heavily timbered as far as the eye can see. And now we saw a new style of habitation, built in little clearings that lay back from the river and hidden in the jungle. These were the homes of pygmies. Their houses are built in trees and on the tops of tall poles, about 50 feet above the ground. Here we were flying north, up the Ok-Tedi, and we saw many of these hidden villages in clearings from one to eight miles back from the stream. Obviously there is a considerable population in this area.

Toward noon we turned back and flew across to the Fly and proceeded up that stream. Here we attempted to get above the clouds to catch a glimpse of the stately Victor Emanuel Range to the north, but after mounting to 12,000 feet and still flying blind through the clouds, with temperature 39° Fahrenheit, Peck decided there was no top to them and nosed down to clear air. Again we saw clearings with tree-house villages, but they were not so numerous here as on the Ok-Tedi. These cleared places were usually well back from the river and could be seen from the air only.

The Fly River had now narrowed to a

Photograph by Dr. J. Jeswiet

NEW GUINEA LEAF-HOPPERS, NOT BUTTERFLIES

rushing stream, not good in case of forced landing; so we turned up a tributary, the Palmer River. The mountains were now quite close.

EVERY PYGMY DWELLING IS AN ARSENAL

We continued up the Palmer until it became a narrow torrent with a canopy of overhanging trees. There were no signs of habitation, so Peck turned back southward, to my great relief. Landing in those trees would have ended us. We were then about 600 miles from the nearest white settlement and more than 300 miles from our base camp. We had reached the very source of the great Fly River and had seen what we set out to see—the character of the country and the indications of native settlement where sugar cane might be concentrated.

After we turned to fly back down the Palmer I directed Peck to land at a pygmy tree-dweller town we had seen on our way up. It stood on the Fly, just below its juncture with the Ok-Tedi. That same day we were to learn what an emotional shaking-up we gave these pygmies when we zoomed over their tree houses. No doubt they are still telling of the big hawk that came with thunderous noise out of the upper air to carry them off.

We landed, luckily, without crashing into any of the partly submerged logs floating rapidly downstream, and taxied into the backwash of a huge whirlpool which had carved a recess in the river bank in front of the village of tree houses.

We all got ashore after more or less difficulty, and Champion and I climbed to the jungle-covered bank 20 feet above us and headed for the village.

A crooked bush path brought us to the clearing, and I had my first view of one of these extraordinary habitations. Its floor was about 45 feet above the ground and its chief support was the trunk of an enormous tree, supplemented by its aërial roots and long poles brought from elsewhere (see pages 289, 291, 309).

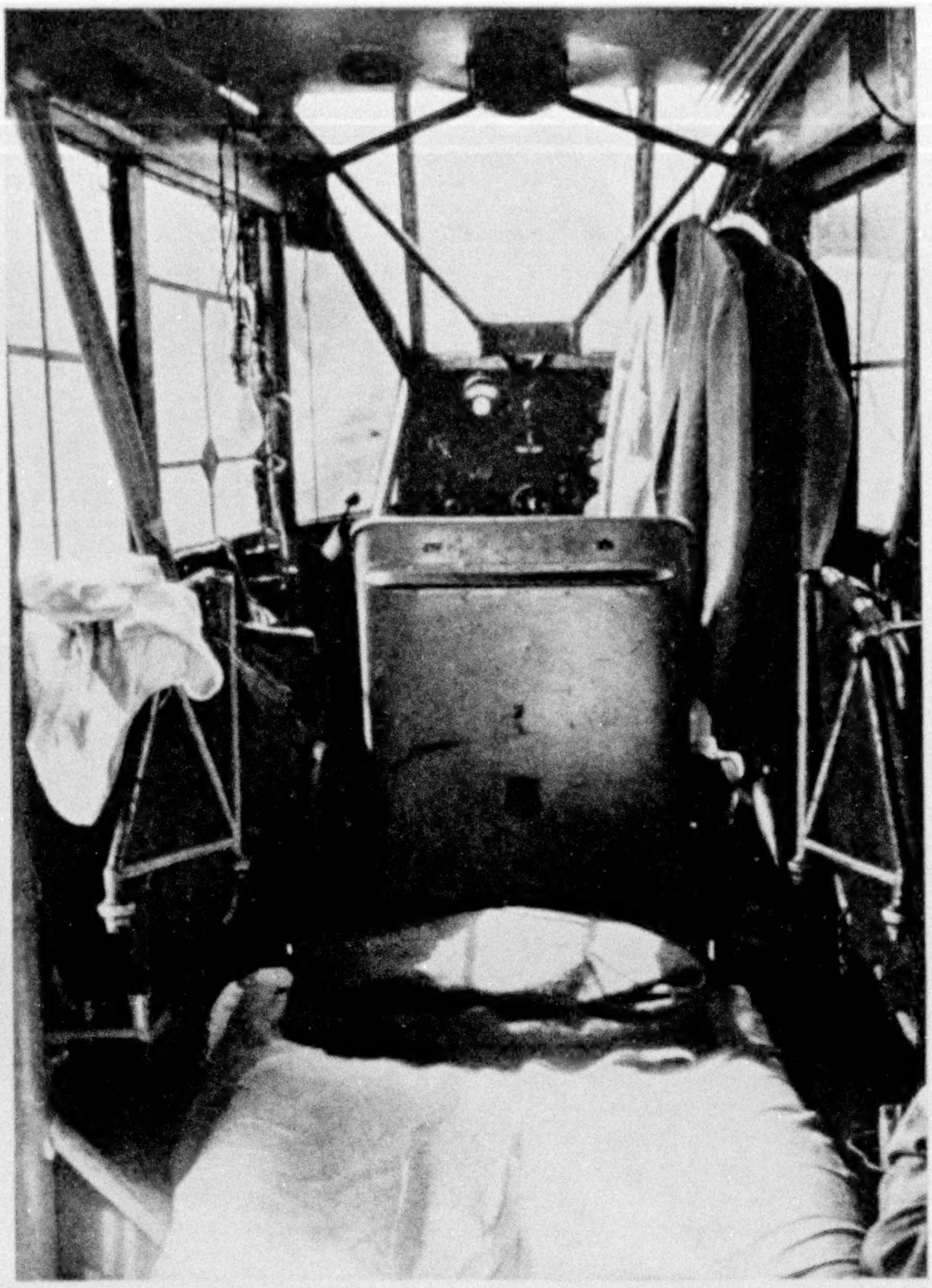
There was no sound. The place seemed deserted. I was foolish enough to walk below it for closer examination. I know now just how foolish I was. Two hours later it was revealed that this hut was still full of savages.

Each of these dwellings is a veritable

arsenal of large rocks, arrows, etc., which the beleaguered occupants shower on attacking parties through small holes in the walls and trapdoors in the floor. For some reason my head was spared. Still not knowing that anyone was in the tree house, we went back to the river's edge, at a point that seemed a landing place for canoes. Upon reaching it I heard a shout from Peck, who was still in the plane, which lay around a bend some 200 yards below us. He was calling attention to two slender canoes, loaded with people, paddling feverishly for the opposite shore about a mile upstream.

PYGMIES ARE THE DANDIES OF THE PAPUAN WORLD

We called in our most seductive tones; we even used the magic word *sambio* (peace), which worked well on Lake Murray. Finally, though not till they had crossed the stream and got under the shelter of overhanging boughs on its far side, the fleeing pygmies appeared to pause and regard us with curiosity. This was a toehold, anyway; so we waved red calico at them.



Photograph by R. K. Peck

TO PROTECT HIS PLANE IN THE WILDS, PILOT PECK SLEPT ABOARD

In the cabin a pneumatic mattress was unrolled and inflated. At the left is the folded mosquito net. Others in the party camped ashore.

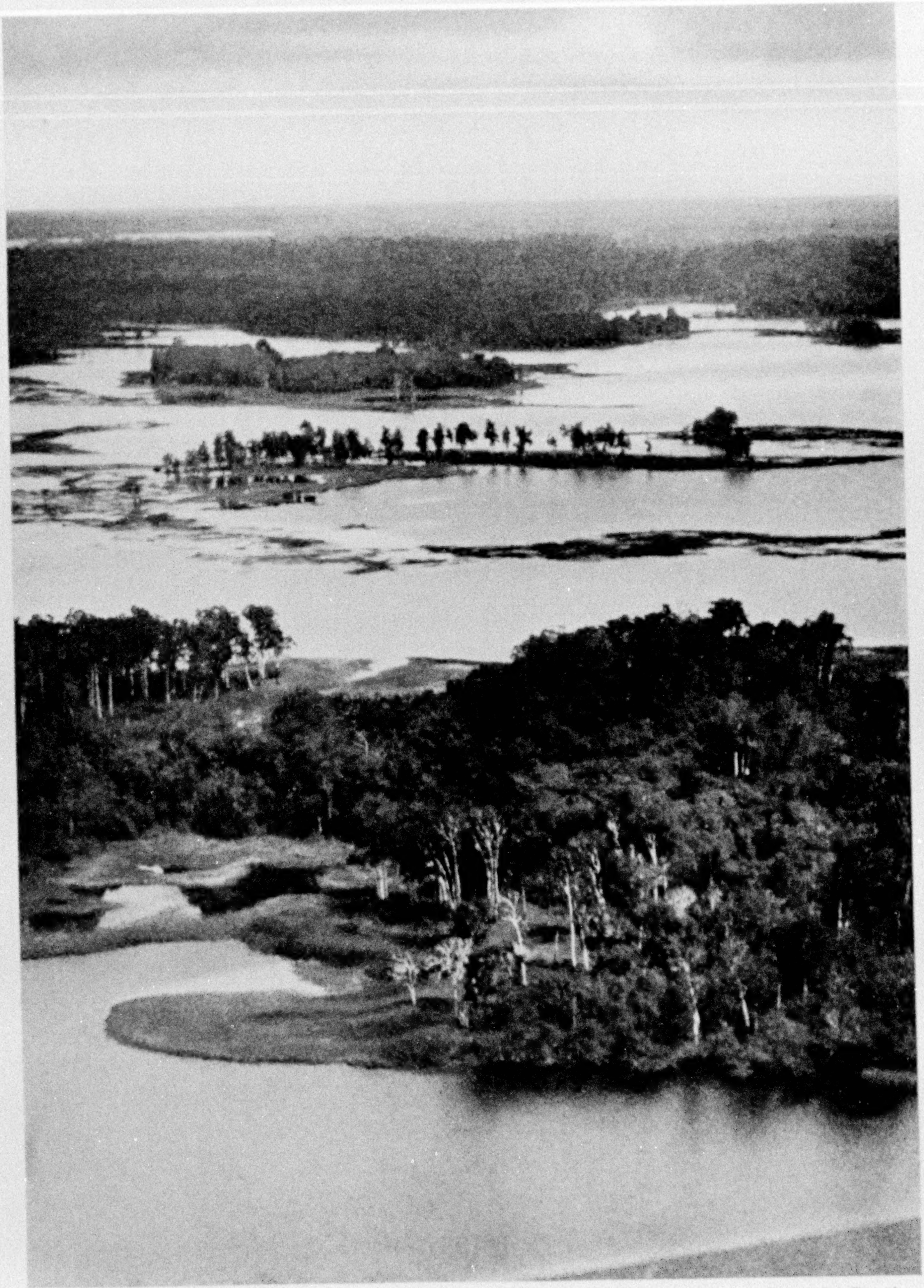
For a long time no move was made. Then we saw them unloading some pigs and women from their canoes.

We kept up our friendly calls and gestures. Finally a canoe with four or five men in it put out and cautiously approached. When their long craft got close enough for us to see their faces, we smiled and held up our empty hands. As their canoe scraped the mud bank, we walked out, smiling, and patted the little men on the back and shoulders.

The hair of the heads and beards was decidedly kinky and rather short, a much closer approach to that of the Negro than any we had previously encountered.

Looped black cassowary quills about six inches in diameter were worn for earrings. Flying-fox claws, in some cases tipped with fur or feathers, projected upward from holes in either side of the nose, the *tout ensemble* being capped by a headdress of cassowary feathers (see illustration, page 293).

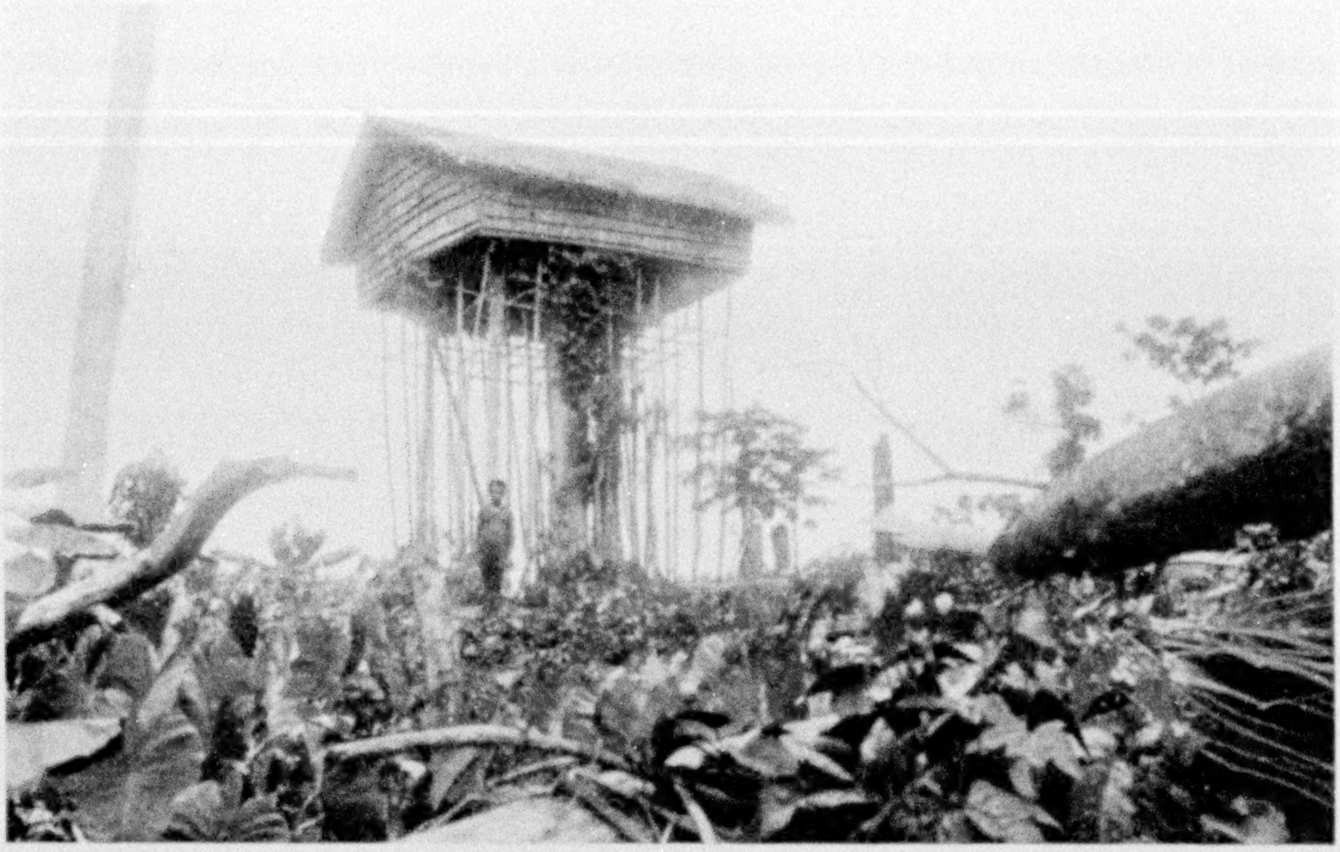
It was now that we learned that the tree



Photograph by Dr. E. W. Brandes

PERILOUS TO WHITE MEN AFOOT, ISLAND-DOTTED LAKE MURRAY COUNTRY FROM THE AIR IS A REGION OF RARE CHARM

In these waters blooms a beautiful coral-pink lotus whose flower is sometimes 12 to 14 inches in diameter. The author dived into murky waters seven feet deep to get the roots of one plant and, after nurturing it at Base Camp for a week, flew with it to Kikori, dropped it overboard in a small parachute, and it was planted in a garden at that post, where it is now thriving. From this point it may be brought to gardens throughout the world.



Photograph by R. K. Peck

AN UPPER FLY RIVER NATIVE PERCHES HIS HOUSE HIGH IN AIR

Behind the man is a notched-pole ladder, by which he climbs to his home. Surrounding trees, felled in a confused jumble, form a sort of *chevaux-de-frise*, preventing enemies from rushing the tree dweller's home (see text, page 311).

houses were not empty, for men began to swarm down from them. After exchanging gifts I led them to a small patch of sugar cane and made signs for them to cut me some. Then I indicated a desire to visit the village we saw across the river.

After some hesitation, because their women and children were assembled there, they consented to take us. Champion and I entered the tippy canoe, and with two paddlers in the bow and two in the stern we were shot across the turbulent waters.

At the moment of landing, a crocodile raised its warted and malevolent head beside me. We often had these reminders that the waters concealed formidable enemies and had to be constantly on the alert. It is said crocodiles have grabbed men, even from the security of their canoes.

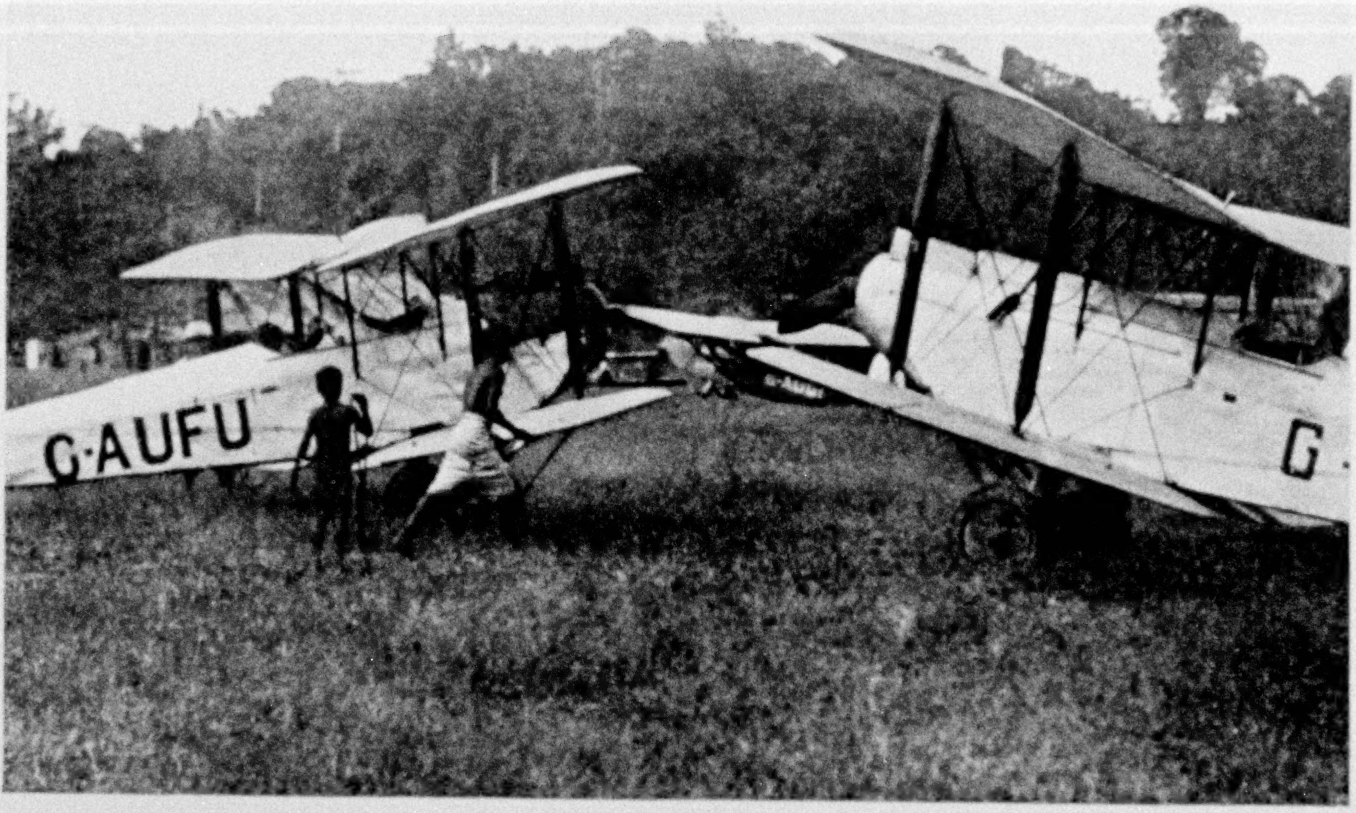
This village had three tree houses, all like the one across the river. I gathered cane fast, as the sun was now sinking. I got five varieties. Then we bartered for weapons and ornaments. The pygmies seemed pleased with the matches, jack-plane blades, safety-razor blades, beads, and cloth which they got from us.

The timid little women, about the size of our half-grown children, were by this time satisfied that our mission was peaceful. They emerged from hiding to view the white-skinned strangers, who must have seemed like giants to them. Unlike the men, they wore an apron of shredded palm leaf. It was four inches long in front, but considerably longer behind.

LITTLE FOLK PROVE FRIENDLY

We were led to note with pleasure the friendly, compatible natures of all these little folk, so utterly different from the fierce dispositions of the general run of natives we had fraternized with in the lake region during the previous week.

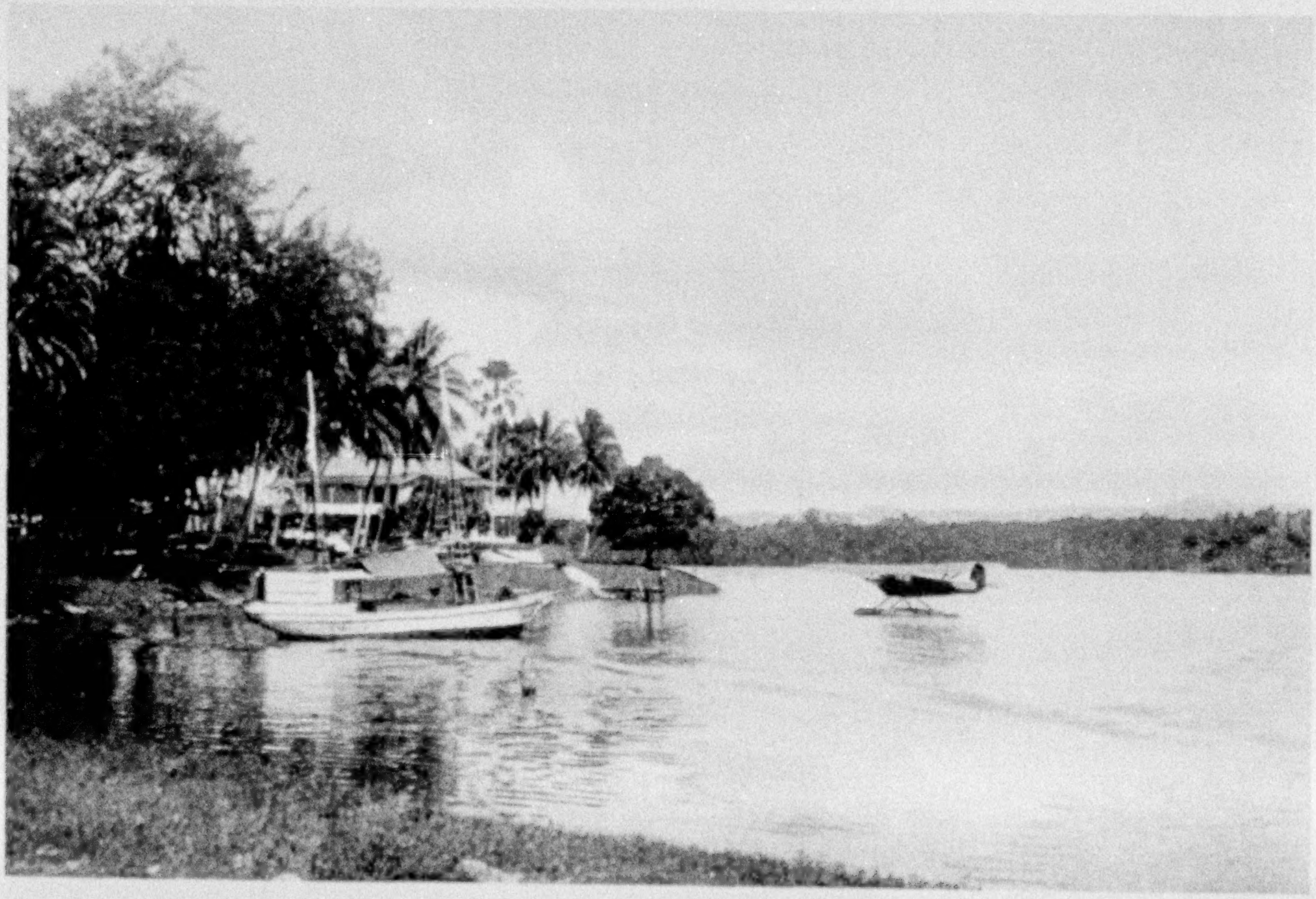
We returned to our plane, and pygmies helped us make a clearing on the bank where we could pitch our tent fly. After dinner, men from the village squatted in a circle before the camp fire just in front of the tent and we were now treated to one of the real surprises of the trip. In the light of the fire, flickering with eerie effect on two shining black faces before us, one of the men spoke up out of the guttural babel of voices and addressed us in perfectly good Malay.



Photograph by Dr. E. W. Brandes

A GOLD RUSH BRINGS AUSTRALIAN PLANES TO NEW GUINEA'S OUTPOSTS

Miners, prospectors, mail, and supplies are carried from coast to gold diggings. These two biplanes at Lae are ready to fly to Edie Creek goldfields, 55 miles back in the mountains.



Photograph by R. K. Peck

MADANG, IN NORTH EAST NEW GUINEA, WAS FORMERLY A GERMAN SETTLEMENT

On their daring flight from Port Moresby, over the high mountains, to the north coast, the Americans carried mail from the Papuan Government to the New Guinea Territory settlement at Madang.

Photograph by Dr. E. W. Brandes

WUSSI RIVER MEN COLLECT CANE FOR THE EXPEDITION

Because these natives were in contact with German traders and officials when, in pre-war days, Germany controlled North East New Guinea, they speak a few words of German. They call small coins "marks."

This man, Jarep by name, had been over the line in Dutch New Guinea and had associated for years with a band of Malay bird-of-paradise hunters. Peck is quite proficient in Malay; so we gave up grunts and signs for a basis of real understanding.

With what delight the other Negritos welcomed this opportunity to get a tangible explanation of our presence there and to exchange ideas! We learned the native names of villages, rivers, and individuals; of their constant dread of the bad men below, and the reasons for their peculiar styles of architecture, together with much of historical interest.

Jarep said that when our "great hawk" appeared over his village all the people immediately concluded that their last hour had arrived and they would soon be eaten. They pitched themselves violently on the ground and buried their faces in the earth. It was only after they had recovered that we saw them paddling across the river for dear life, with pigs and women aboard.

We talked until about 10:30, and learned that another village, which we had sighted from the air, was within walking distance. So, with the promise of an escort to conduct us to it on the morrow, we turned in with a feeling of complete security in the land of our new friends. The natives repaired to the trees, from which we heard, during our periods of wakefulness, the sound of drums and eager, excited voices until the sun rose.

TREE VILLAGE IS PROTECTED BY HURDLES

Champion and I started through the jungle next morning, leaving Peck to guard the seaplane. We followed a well-marked trail and were accompanied by 15 or 20 of the little men, who rushed ahead to break down branches, bend saplings aside, and clear the path, for we were so much larger than the people who customarily used it. They kept up a chatter and smilingly beckoned us on when they stopped to bend down a sapling.

Photograph by Dr. E. W. Brandes

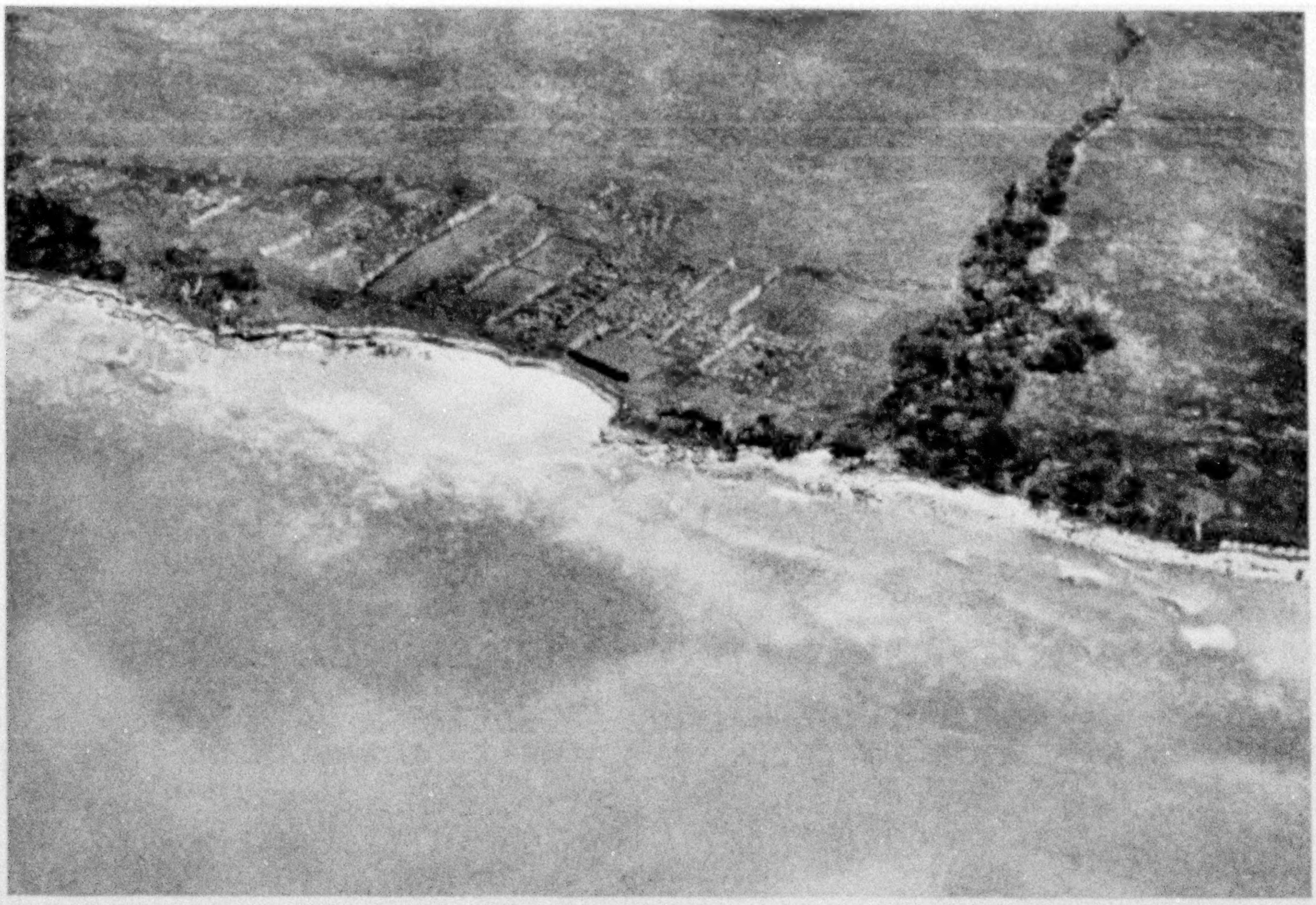
FROM ABOVE, COCONUT GROVES LOOK LIKE VAST AREAS OF GREEN MOSS

This commercial coconut plantation is set in orderly rows and is well cared for, with a lane running through it. It stands on the coast, between the mouth of the Sepik River and the important north-coast town of Madang (see page 310). The three white splotches are native villages. A meandering river makes an island at the right.

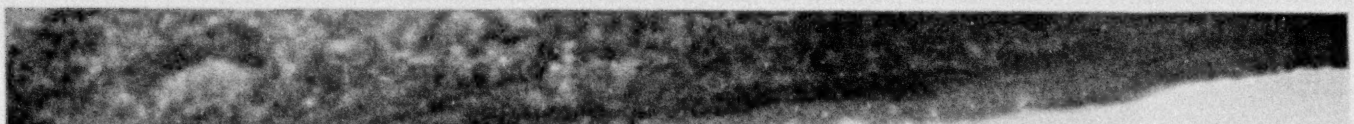
After going about five miles, it became terrifically hot in the sweltering, steamy woods. At this point we encountered what seemed like hurdles across the path. They were merely saplings, cut with stone axes so they would lie transversely 20 to 24 inches above the path, about 3 feet apart. With every step it was necessary to pick up one's feet like a high-stepping horse. After two miles of this my feet weighed at least a ton each! The pygmies bounced along on these obstructions like squirrels or cats; but when I tried this the poles broke and let me down. I could not conceive of a more effective way for the pygmies to confuse and confound their heavier pursuers until they were able to assemble for defense of their little fortresses (see page 309).

Another mile brought us to the clearing. Here were signs of activity indeed. For fully a quarter of a mile, between the edge of the clearing and the nearest tree house, there was a hopeless tangle of tree trunks extending in all directions and covering the ground for a height of from 6 to 15 feet, making it impossible to proceed except over the insecure branches and trunks.

Over this barricade of fallen jungle we



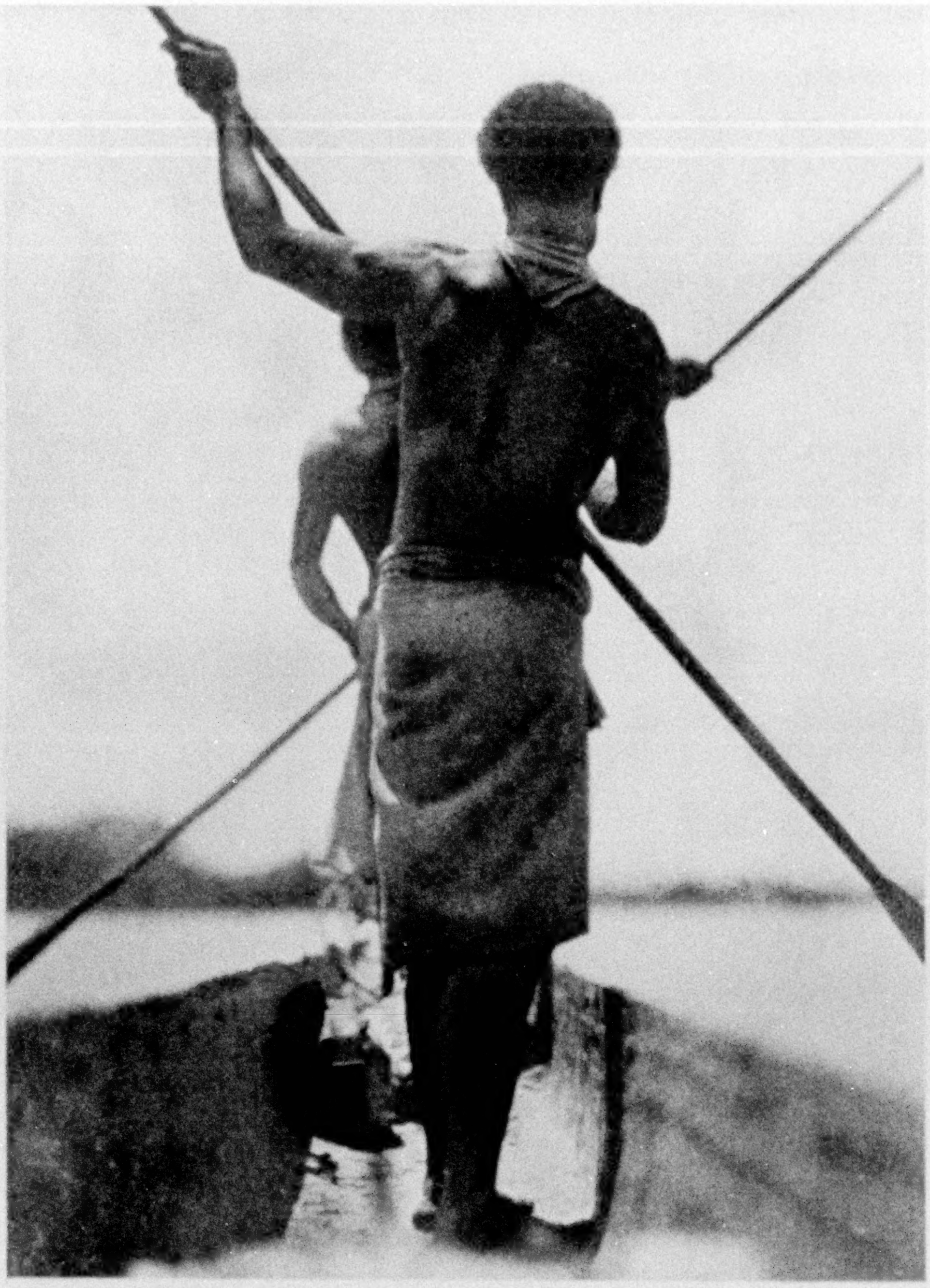
AN AIR VIEW OF FENCED, RECTANGULAR GARDENS FARMED BY SEMISAVAGES EAST OF THE MOUTH OF THE SEPIK RIVER



Photographs by Dr. E. W. Brandes

BRAVE MISSIONARIES HAVE PUSHED THEIR PERILOUS PATH INTO DARK NEW GUINEA

It was here, at Marienberg Mission, 60 miles up the Sepik River, that the Expedition met the steamer *Franklyn.* Father F. J. Kirschbaum, who founded this mission, accompanied the author and Aviator Peck to the foothills of Victor Emanuel Range.



Photograph by Dr. E. W. Brandes

CANOEMEN OF THE LOWER SEPIK STAND WHILE PADDLING

The long, fairly light canoes are very flexible. When twelve or more men are paddling, the middle portion of the canoe can actually be lifted from the water by ingenious knee-flexing and teamwork. During this feat the descending arch in the bent canoe violently slaps the water as the boat leaps forward.

eventually reached the tree house. The villagers told us their garden was a mile or two downstream, on the river bank. We could have flown there in five minutes and landed easily on the water in front of the village.

EACH PYGMY CARRIES HIS OWN FIRE-MAKING APPARATUS

We went by canoe to the garden. It consisted of taro, bananas, sugar cane, and tobacco planted in the same disorderly fashion seen in all native gardens previously visited.

Each pygmy carries his own automatic lighter, a long piece of split rattan wrapped many times about his middle (see illustration, page 292). To start fire he loops this strip of rattan around the end of a cleft stick of dry wood, with some dry punk or tinder in the cleft; then he rapidly draws the strip back and forth, in contact with the combustible material. In about 10 seconds smoke appears and the glowing tinder is fanned into flame.

About six kinds of cane were found in this garden. After photographing them and collecting specimens, we started back on the second lap of our obstacle race to rejoin Peck. Less than a half hour after toiling through that steamy jungle we were in winter temperature, at an elevation of 13,000 feet, flying above the lake plain, 50 miles away.

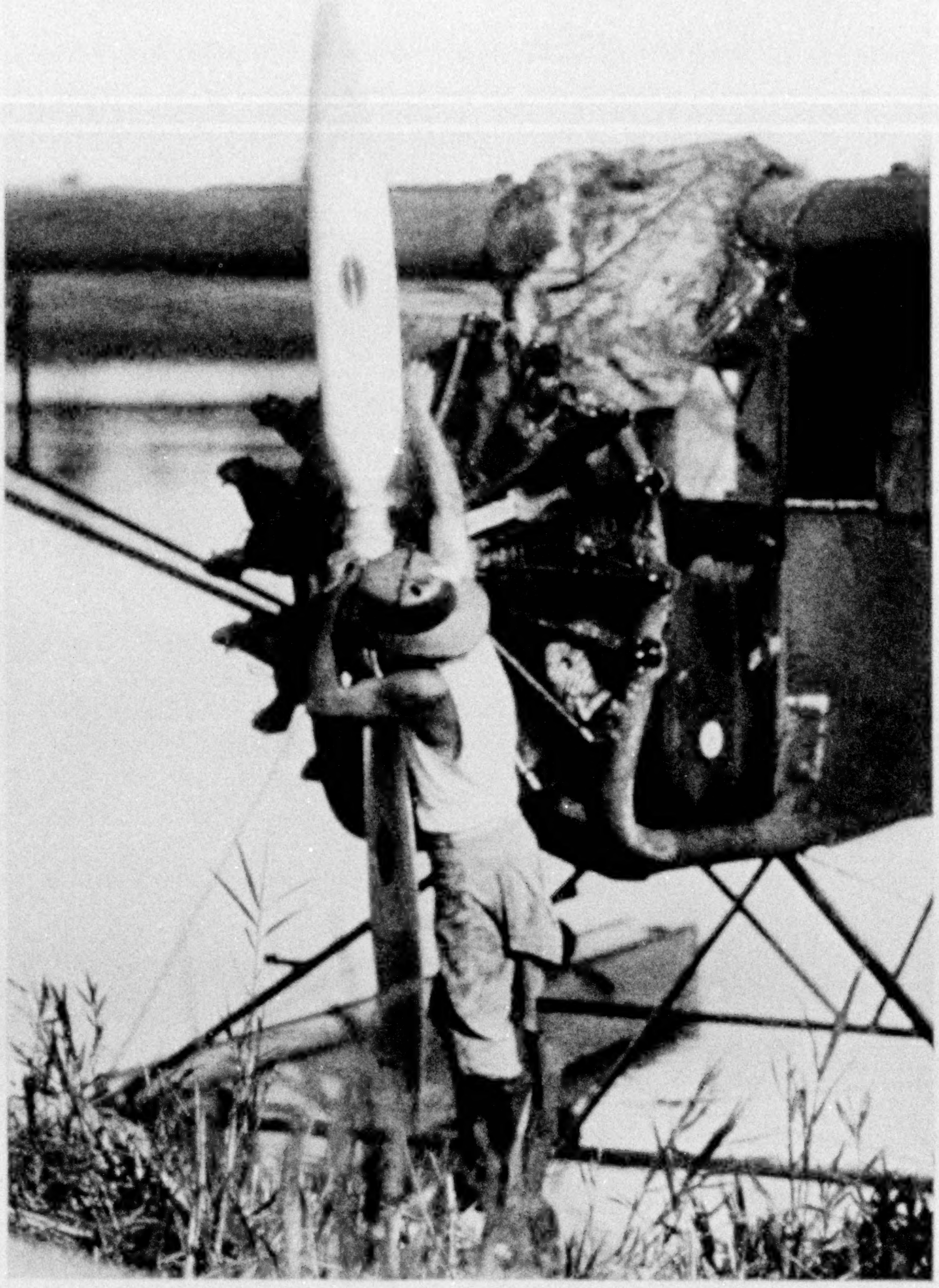
We had quit the pygmies with real regret, but now took advantage of a clear day to photograph and sketch from our high vantage point some of the numerous heretofore-undiscovered lakes in the eastern part of Dutch New Guinea and in western Papua.

One new lake we found and named Lake Herbert Hoover (see inset map, page 255). We so placed it on record at Port Moresby; this not because of any occult hints about political developments in the country we had left nearly five months before, but because of Mr. Hoover's sympathetic promotion of commercial aviation while heading the Department of

Commerce, and his popularity in Australia, where he formerly engaged in mining enterprises. This pretty New Guinea lake lies partly in Dutch and partly in British territory.

Here I must sketch briefly our movements till we reached the former German New Guinea, now administered by Australia under mandate from the League of Nations.

The party now divided. Dr. Jeswiet, Mr. Pemberton, Mr. Champion, and Mr. Bannon, with about 100 carriers, proceeded afoot to the mountains behind Rigo, a station 40 miles east of Port Moresby, while Mr. Peck and I continued by seaplane to collect cane along the north coast and up the rivers of the mandated territory.



Photograph by Dr. E. W. Brandes

AVIATOR PECK AT WORK ON HIS MOTOR

In far-away New Guinea, remote from spare parts, shops, and mechanics, life depended on infinite, unflagging attention to the seaplane. On the Sepik River, near the Marienberg Mission (see page 313).

FLYING BLIND OVER MOUNTAINS AT 14,000 FEET

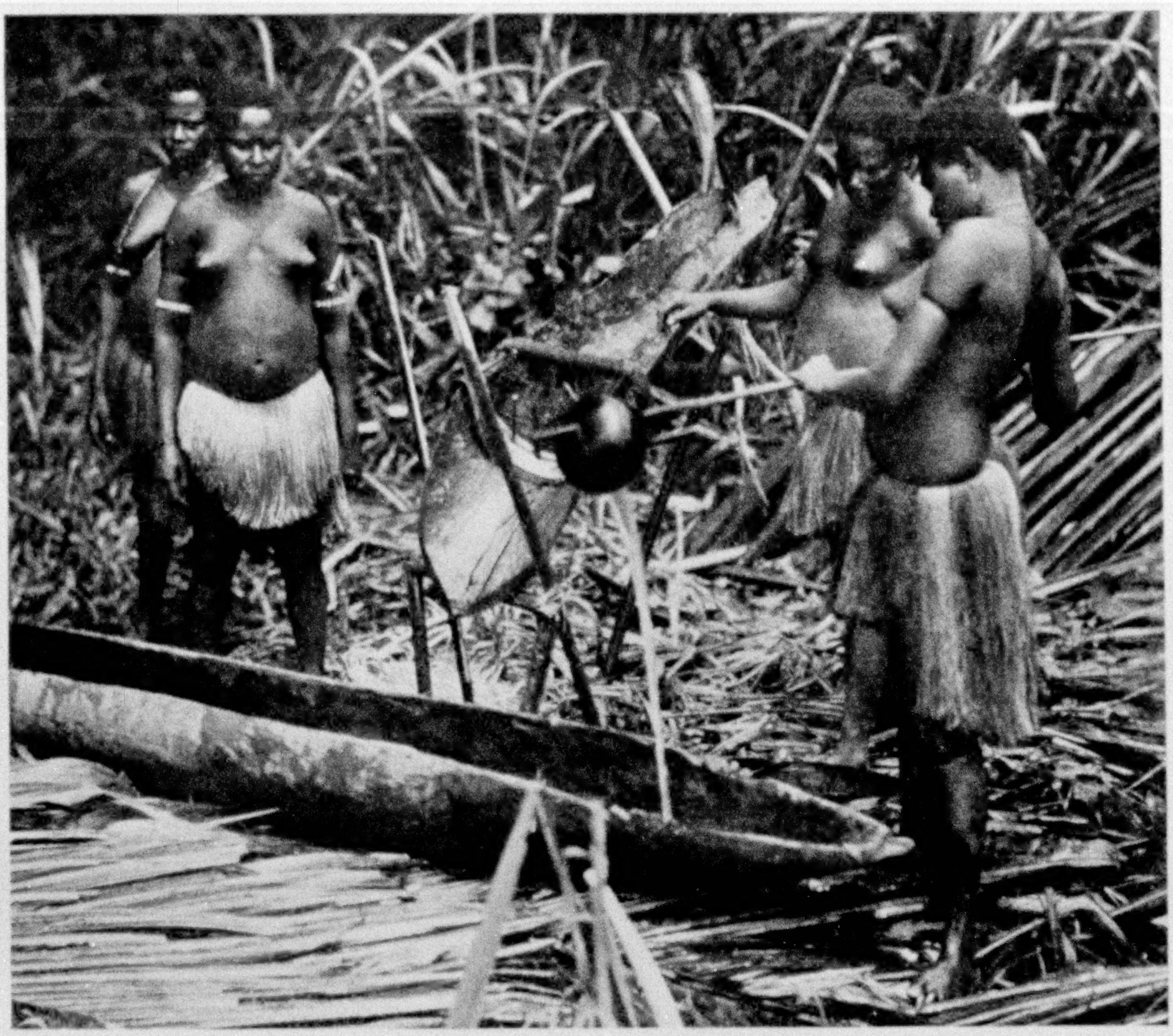
August 24 we set out to cross the high mountains between Port Moresby and Buna, with Lae, in the former German territory, as our destination. Behind Port Moresby were impenetrable high clouds; so we flew east, along the coast, seeking a clear spot for climbing over the mountains.

As conditions did not improve, we started to climb anyway and at 11,000 feet headed inland. Soon the coast plain was left behind and we were above the first range of mountains. Villages could be located on the very tops of mountains. They were near to, yet far away from, other villages, on neighboring peaks, on account of the deep intervening valleys.

Large clearings, probably for gardens, could be seen on the steep, wooded mountain slopes below these villages. Far below, rivers, like narrow silver ribbons, were glimpsed cascading through the deep valleys.

Soon we were in the swirling mists momentarily mantling the higher peaks. Through the rifts we could see the interesting panorama below.

Suddenly we were flying blind at 14,000 feet, with the wing tips barely discernible. It started to rain, and I saw Peck look anxiously at the thermometer on a wing strut. It registered 33° Fahrenheit. A



Photograph by Dr. E. W. Brandes

SAGO TAKES THE PLACE OF BREAD

To make sago in New Guinea, men first go into the swamps and fell the sago palms (see illustration, page 320). Then with sharp-edged mallets they pound the nutritious pithy stems. Reduced thus to pulp, the sticky mass is taken in hand by women, who wash out the starch grains, as shown here.

drop of one degree would mean taking a load of ice on the wings. We could not lose altitude without the danger of crashing into the side of one of the numerous mist-shrouded peaks just below.

Fortunately, after 20 minutes of suspense, we burst into bright sunshine, but a heavy blanket of clouds still obscured the mountains below. Doubtless we had now passed the highest of them. Rifts appeared in the clouds, and with relief we saw the coastline far to the northwest. Peck headed for it, and soon we were over the Musa River, which we followed to the sea; then headed northwest, to follow the coast to Lae.

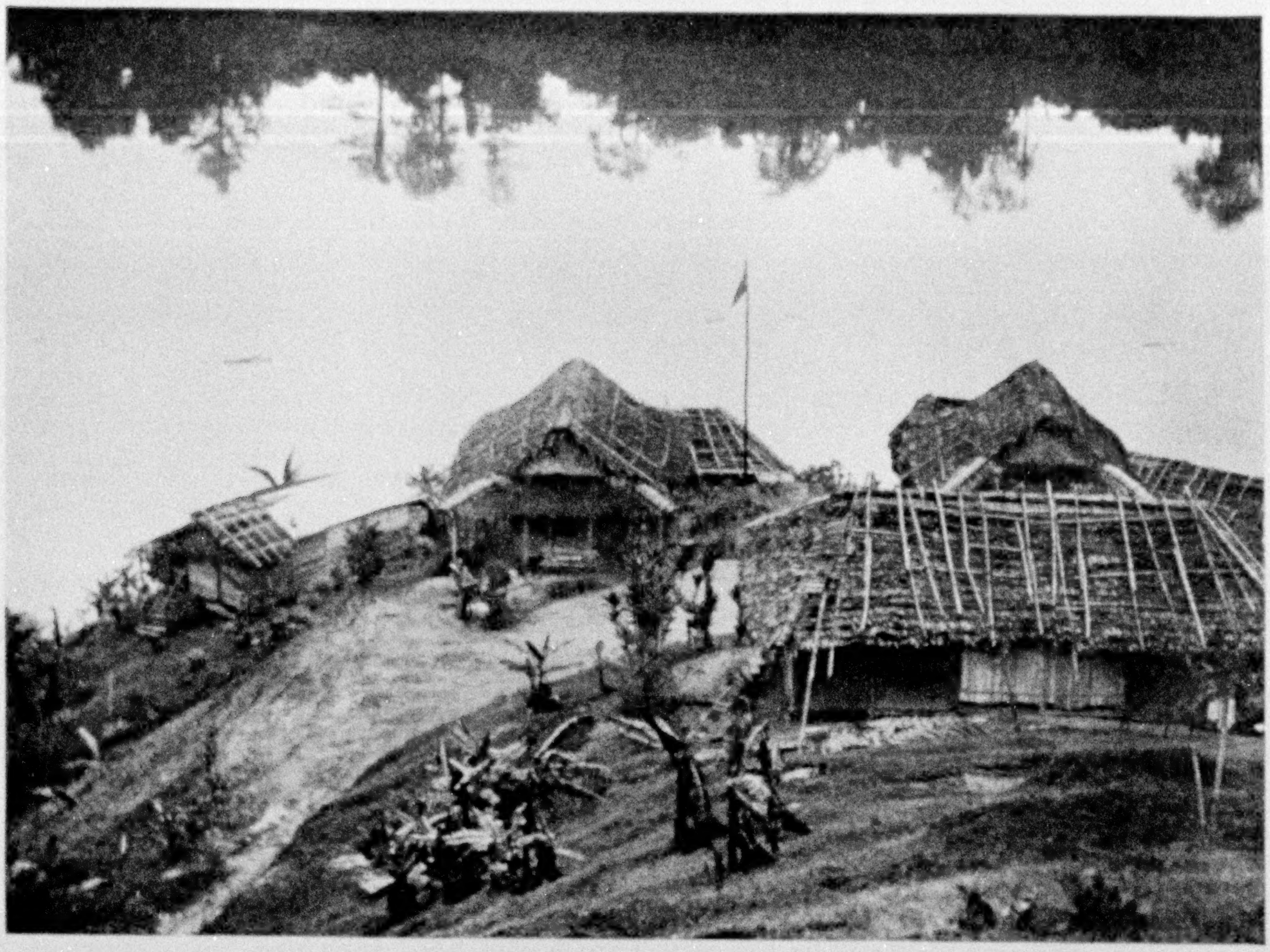
The north coast is distinctly different from the south. In general the mountains are much closer to the sea, in some cases rising abruptly to great heights from the water's edge, with rocky shelves instead of sandy beaches.

We landed at dusk, in the open sea, at Lae, after a circuitous flight of five hours.

Next day we took off for the Sepik River, stopping at Madang, the chief town of North East New Guinea, to deliver the official mail from Port Moresby.

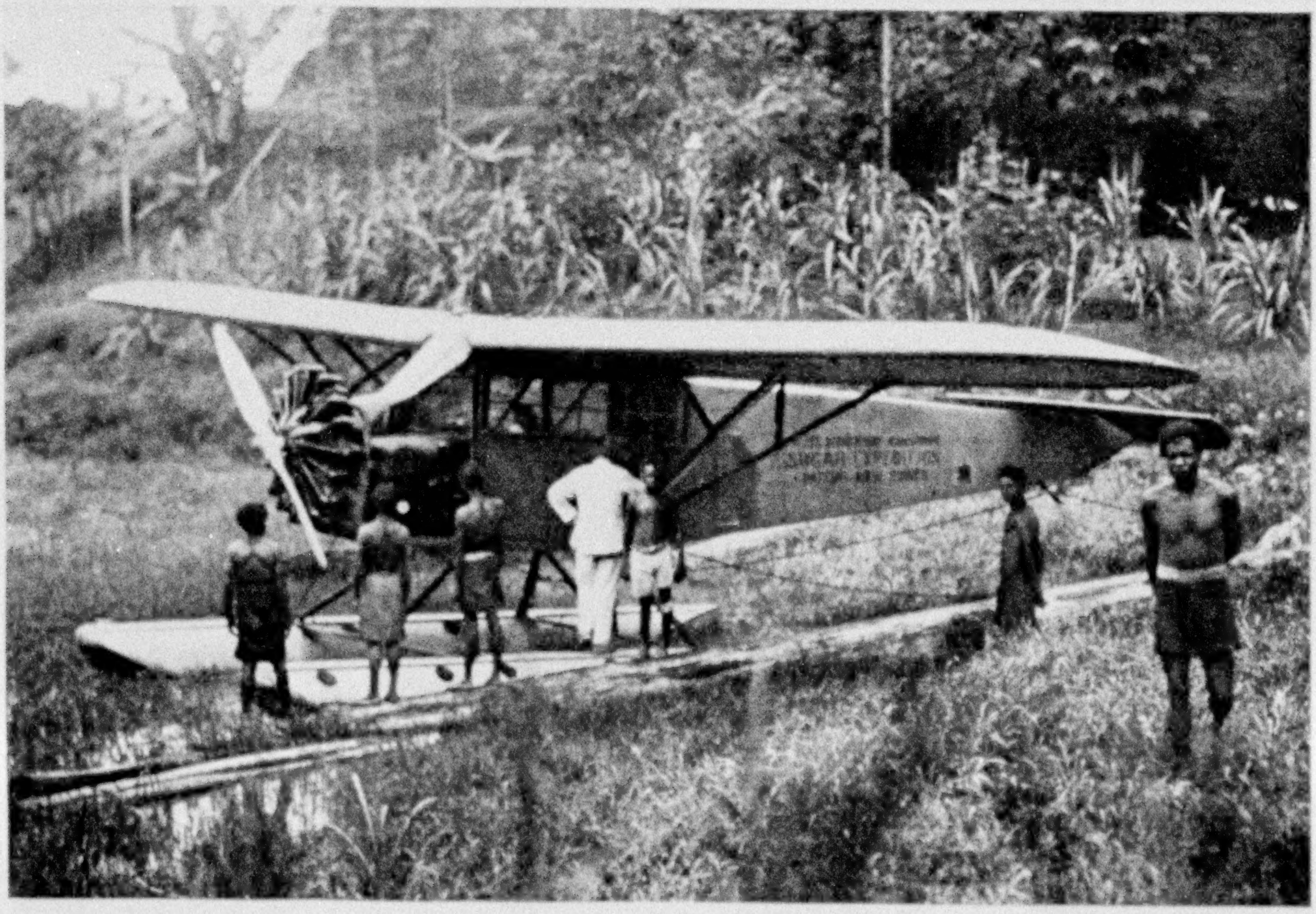
OFF FOR AMBUNTI, 260 MILES UP THE SEPIK

Ashore, we were taken in by Father Franz Josef Kirschbaum at the mission. With this German priest we were to ascend to the headwaters of the river, 650 to 700 miles from its mouth and only



THREE LONELY WHITES ARE STATIONED AT AMBUNTI

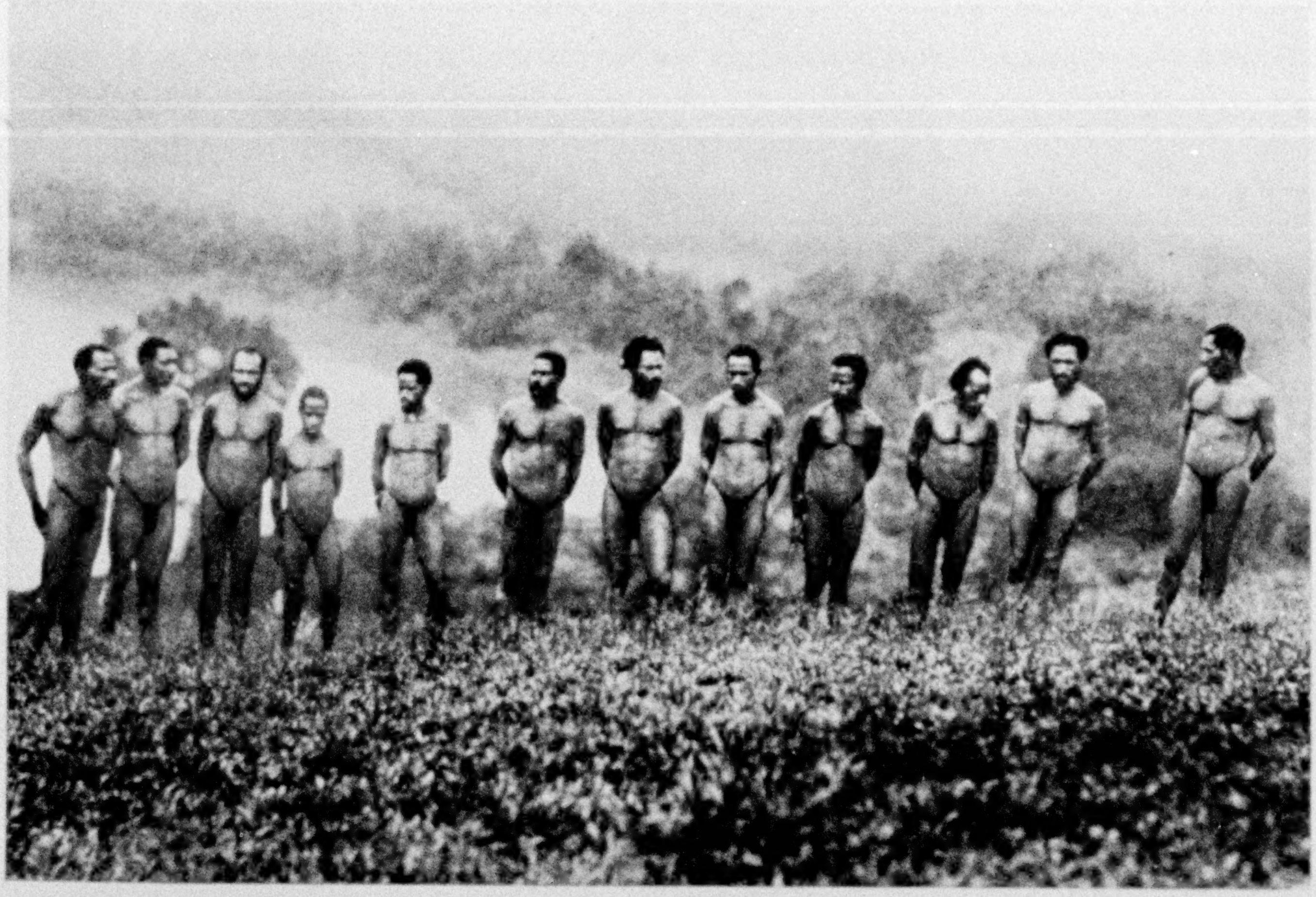
The Union Jack of the British Empire floats bravely from its flagstaff at this police post, far up the Sepik River (see, also, illustrations, pages 318, 319, and text, page 322).



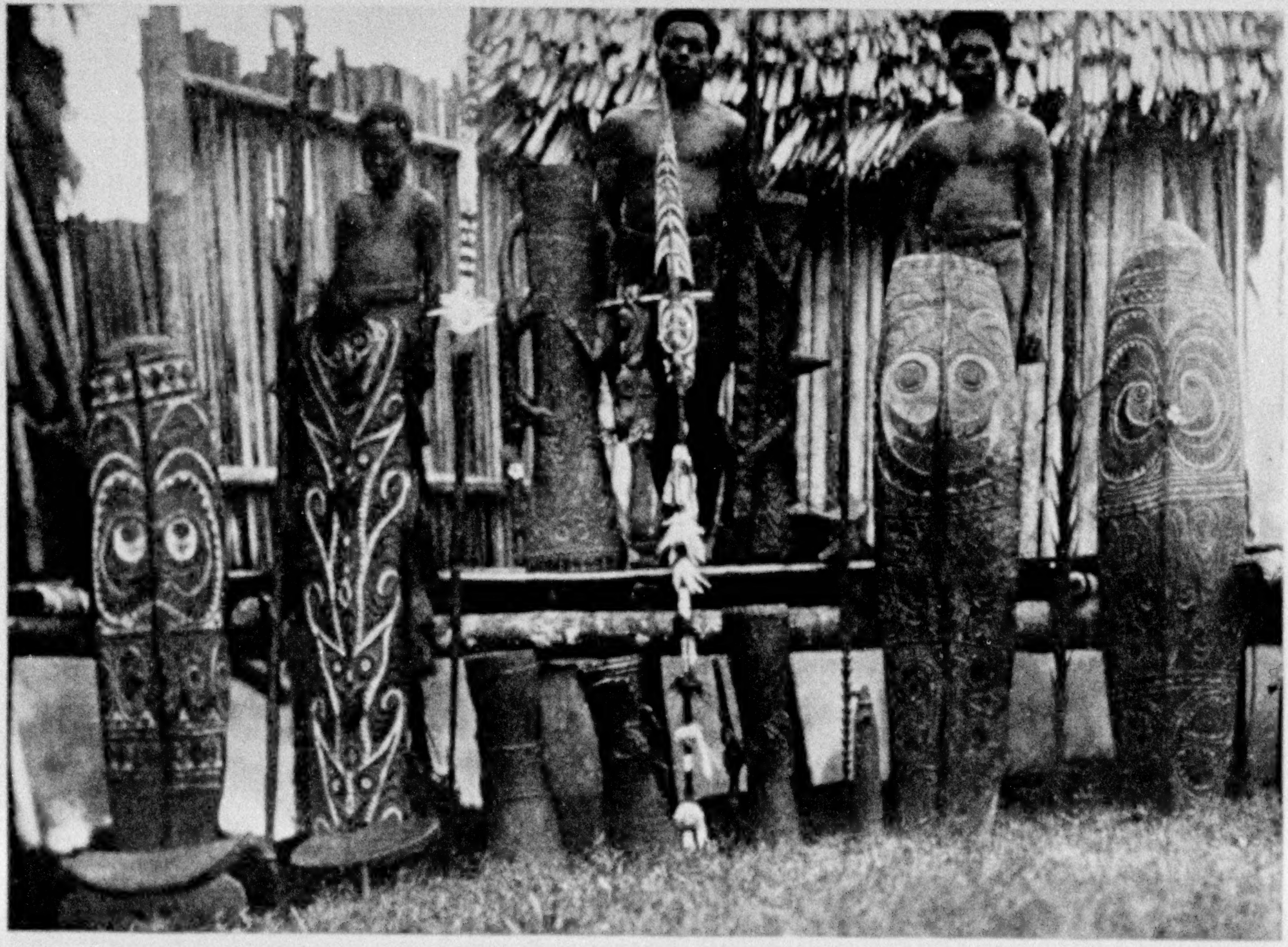
Photographs by Dr. E. W. Brandes

THE EXPEDITION'S PLANE REACHES AMBUNTI, 260 MILES UP THE SEPIK (SEE ABOVE)

On the bank in the background is a field of flourishing cane, which proved to be a variety of a new species, *Saccharum robustum* (see, also, pages 276 and 285). It is peculiar in that its flesh is red and is the only one of its kind found in New Guinea (see text, page 325).



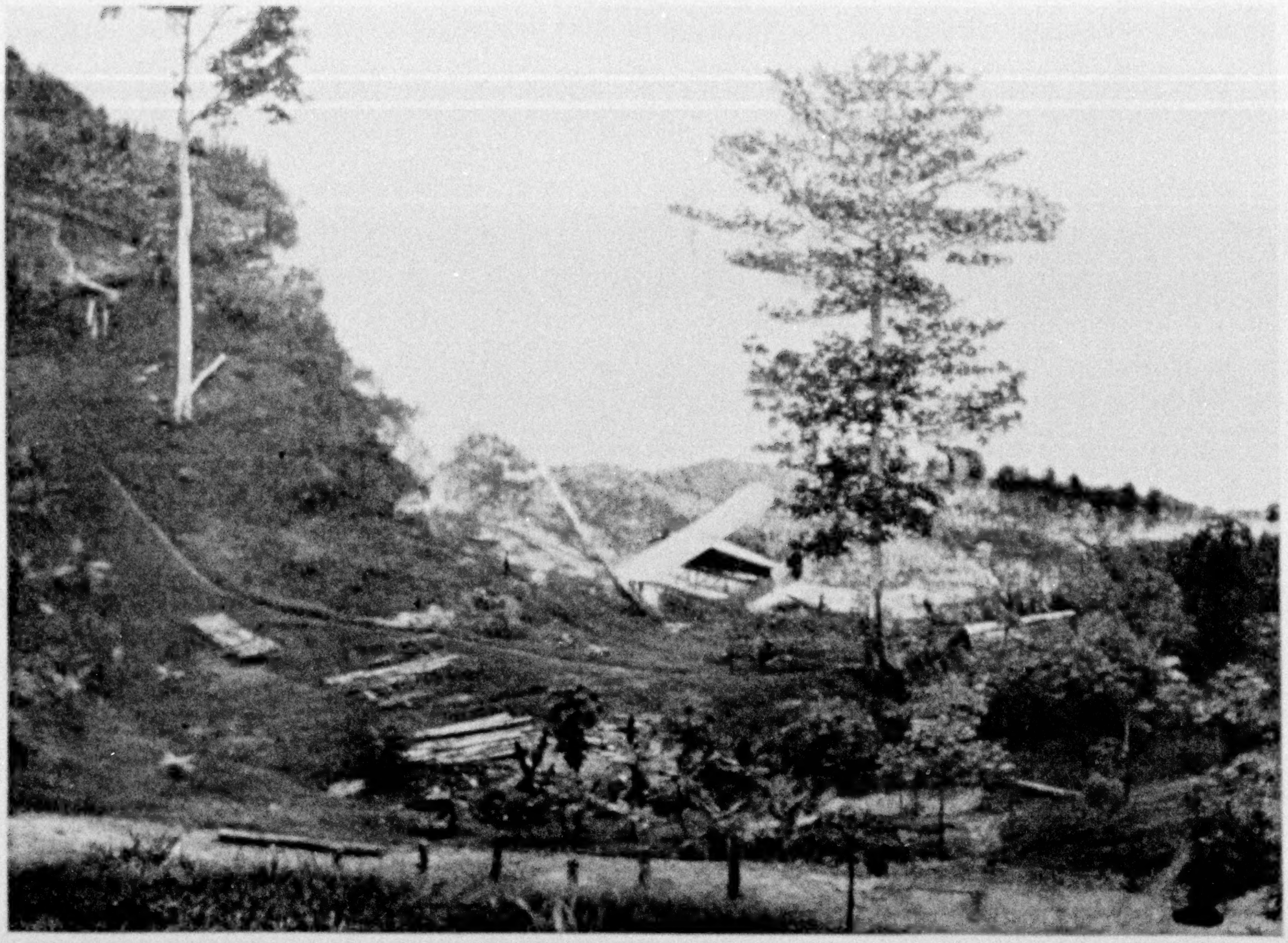
BUSHMEN OF THE UPPER SEPIK WEAR NOT EVEN ORNAMENTS



Photographs by Dr. E. W. Brandes

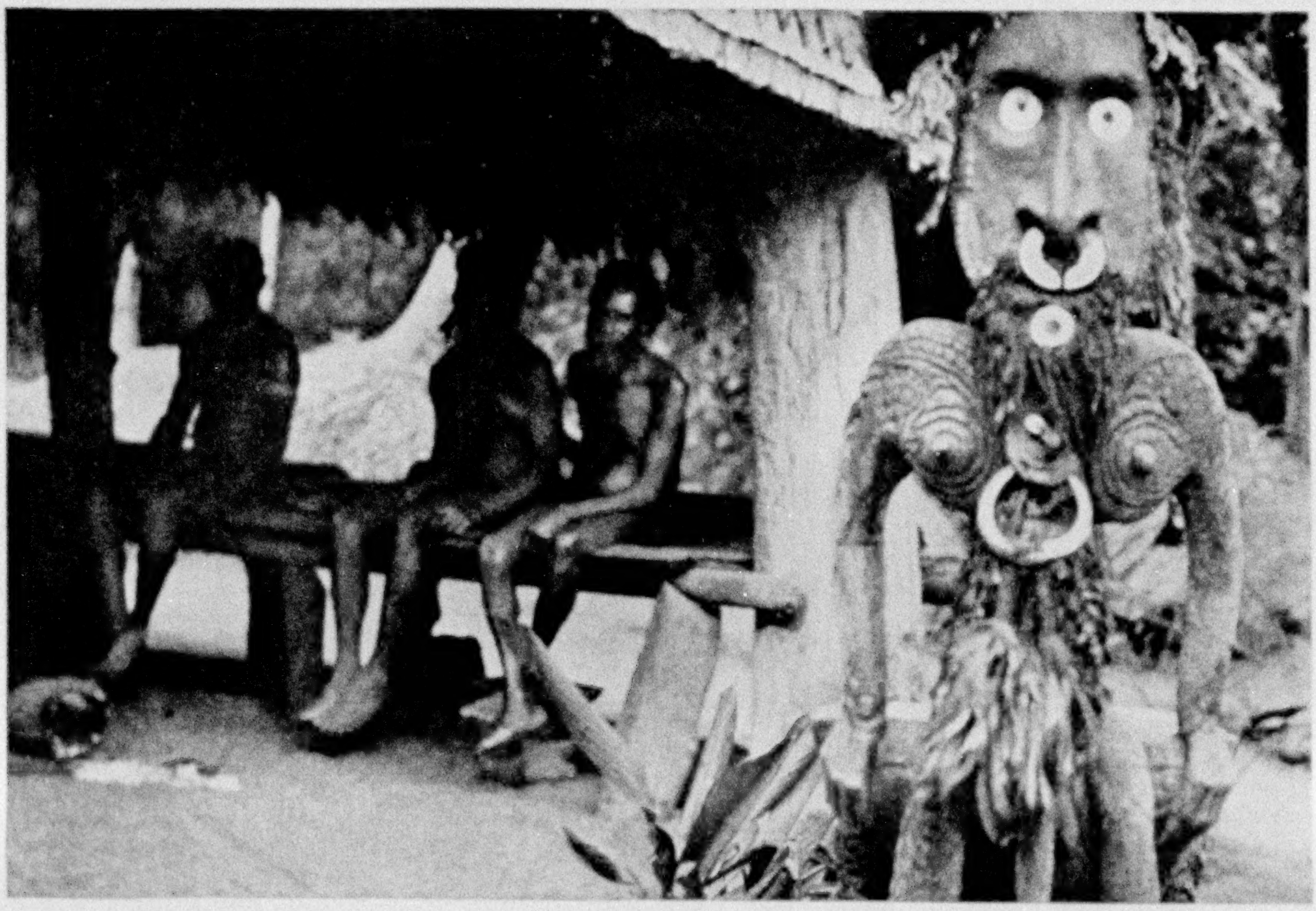
AMBUNTI NATIVES CARVE THESE DRUMS, SHIELDS, AND WEAPONS FROM WOOD

The wooden shields are carried by spearmen and are very heavy and awkward. The two tall cylinders in the center are used for calling crocodiles, supposedly by inserting one end into the water and then suddenly jerking it out, making a gurgling, grunting sound (see page 329).



Photograph by Dr. E. W. Brandes

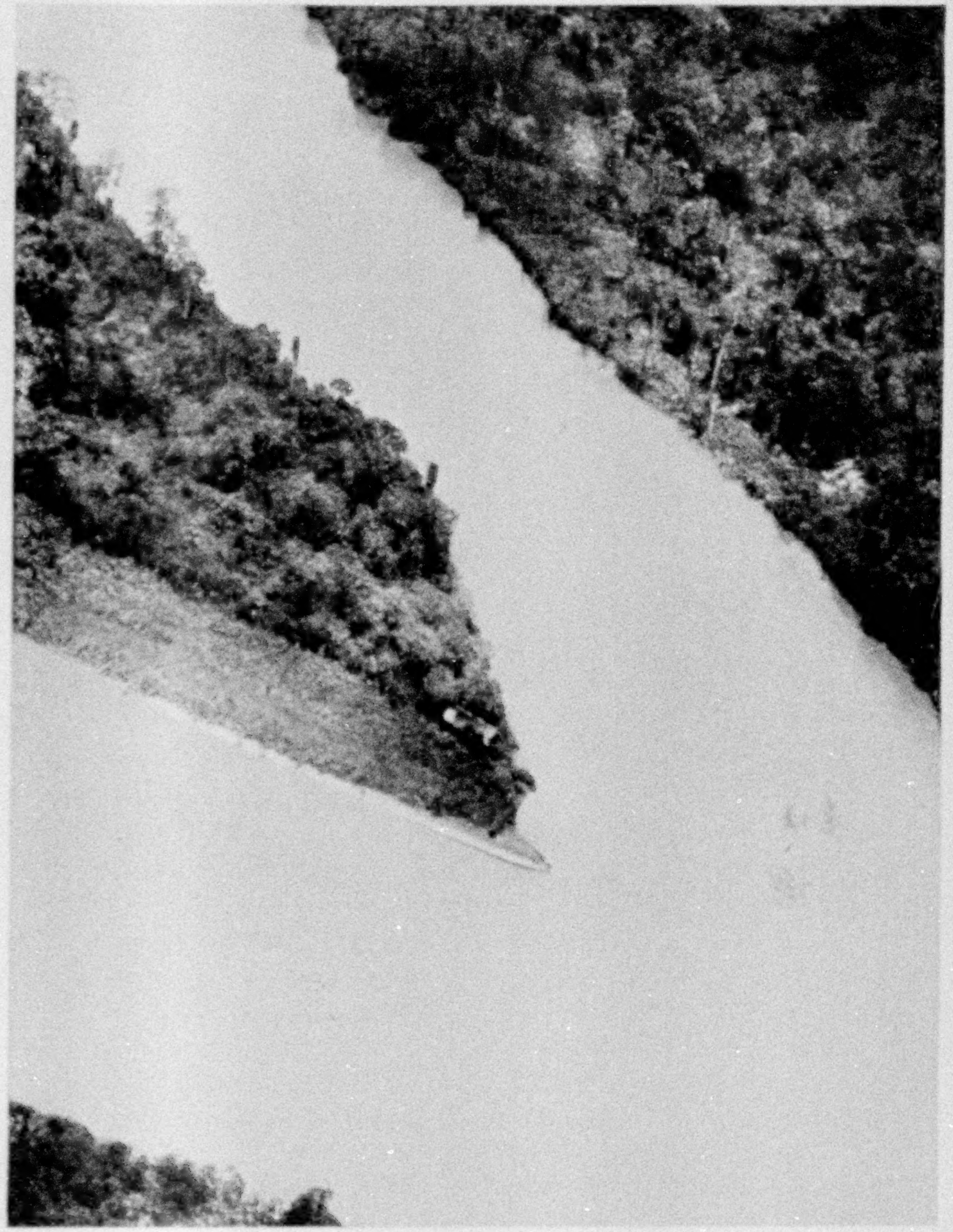
THE SEAPLANE AT THE POLICE STATION IN AMBUNTI



Photograph by Father F. J. Kirschbaum

BESIDE THIS STRANGE FIGURE ORATORS STAND WHEN SPEAKING

When a native of the middle Sepik district wishes to draw especial attention to a certain statement, he adds emphasis to it by pausing to lay a straw on the platform behind this startling effigy.



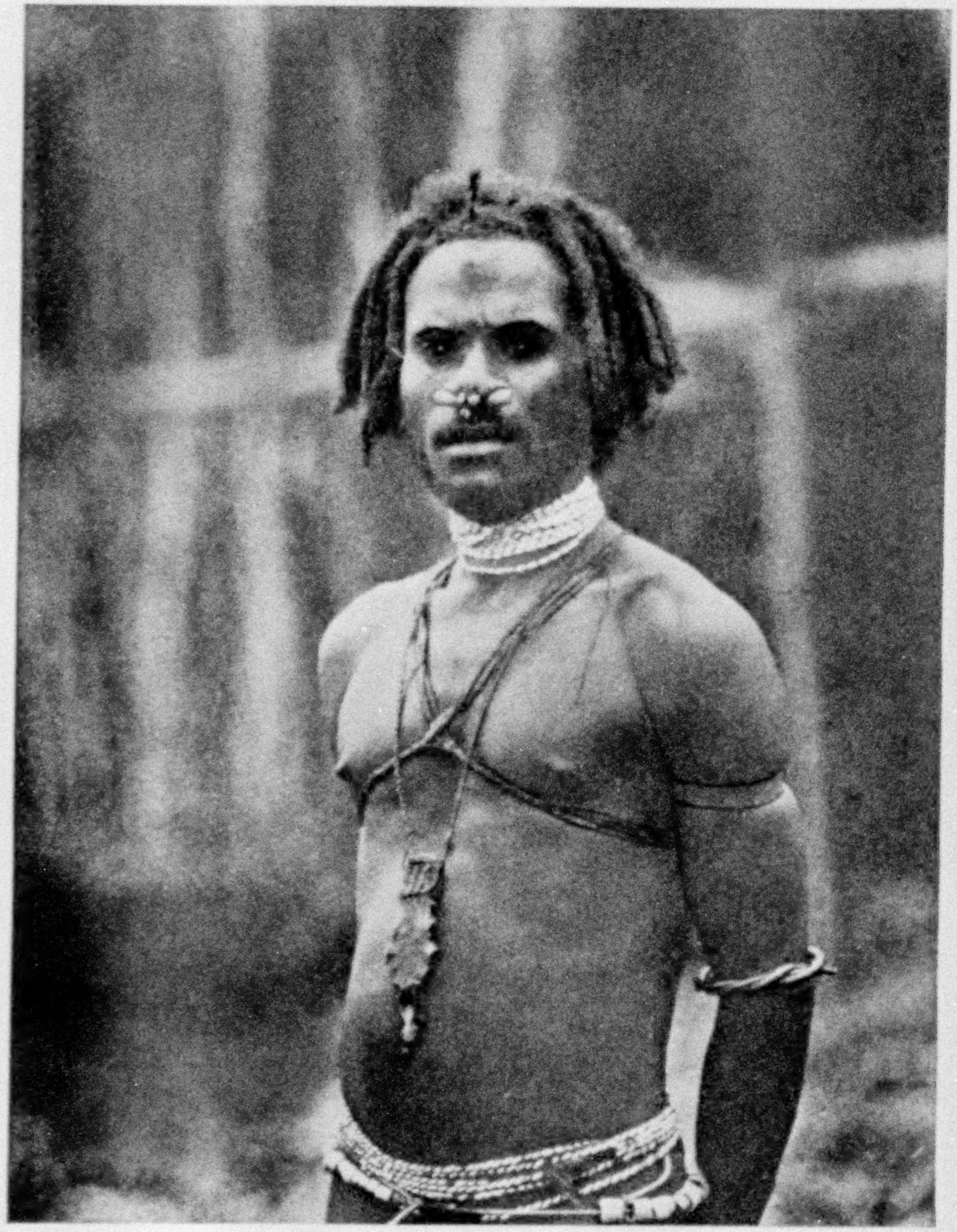
Photographs by Dr. E. W. Brandes

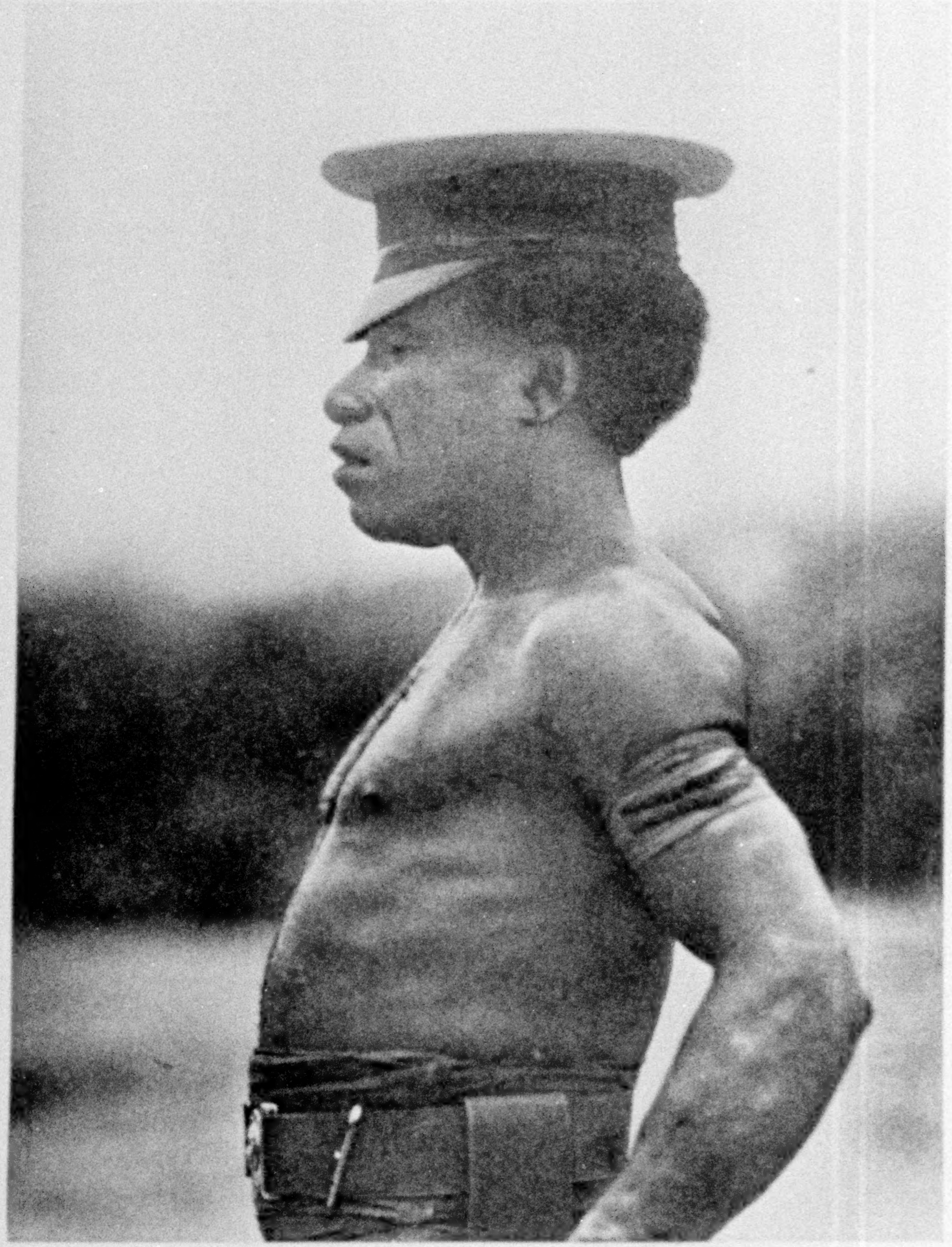
AN ISLAND IN THE UPPER SEPIK, WITH A HOUSE ON ITS POINT

Up this river the American plant hunters explored regions never before penetrated by whites. Signs of human habitation were rare and widely separated.

A STALWART YOUNG WOODSMAN ON THE SEPIK

He belongs to a group of natives who have camped temporarily in the swamps to make sago (see illustration, page 316). His job is to find and fell the sago palms (see, also, text, pages 270-271).





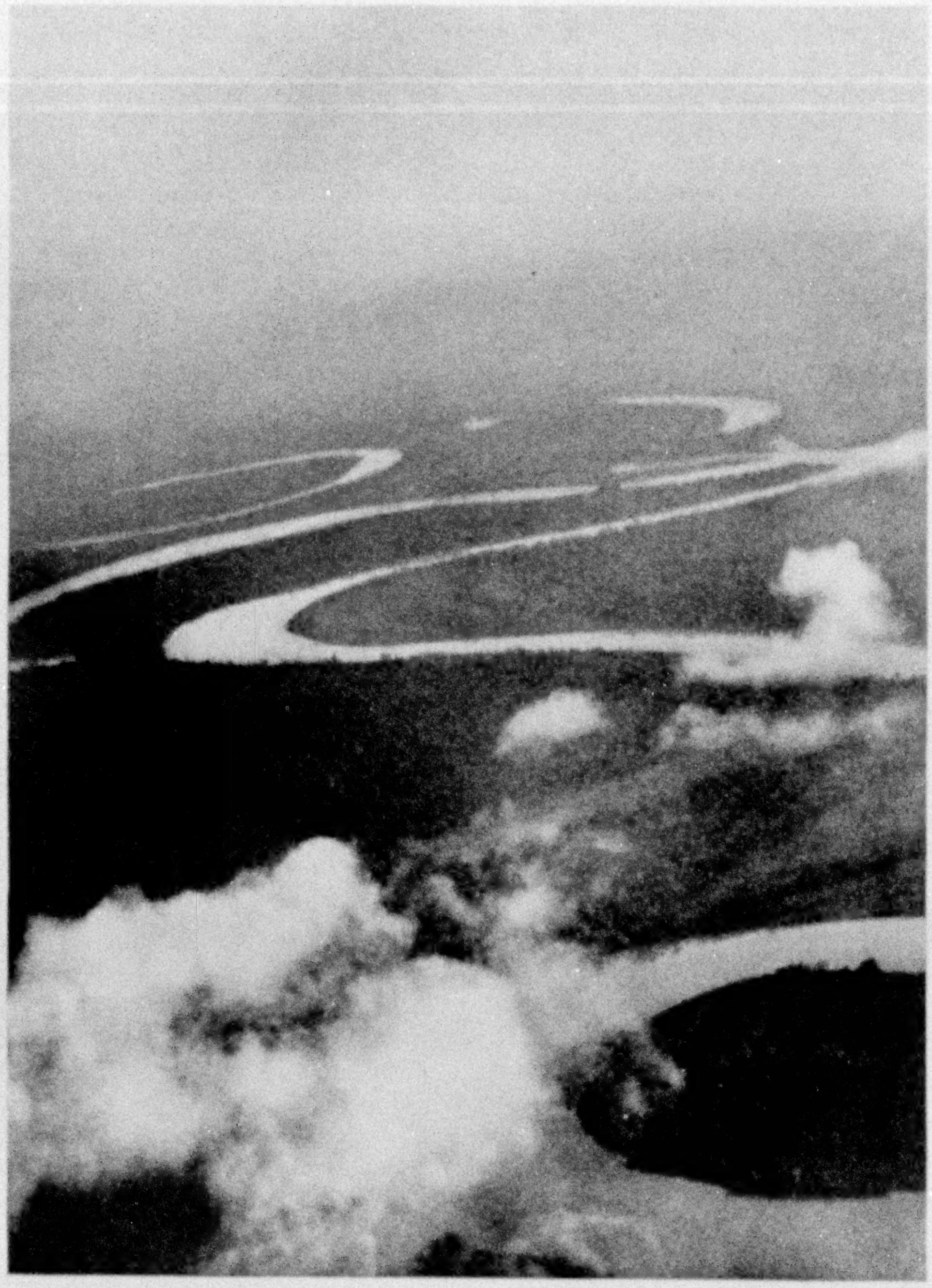
Photographs by Dr. E. W. Brandes

A SAVAGE WHO HELPED TO SAVE THE AIRPLANE

When the airmen descended on the upper Sepik River and were being swept downstream by swift currents, this undaunted native seized a rope thrown to him and aided in preventing disaster (see text, page 323). In his nose he wears a cylinder of bamboo; about his neck is a chain of seeds of Job's-tears. He wears a girdle of the same seed, together with one of human or pig bones. His tight armlet is of woven split rattan.

HE MADE HIS PRISONERS BRING IN THEIR VICTIMS' HEADS!

This is Lance Corporal Bellewi, hero of Ambunti Police Camp, on the Sepik (see page 322). His was an incomparable feat. Aided by only one policeman, he captured 24 jungle savages wanted for murder and marched the whole group four days into camp, compelling each culprit to carry along as evidence the head of a victim. He is a fine type of the civilized native, and has been promoted by the Australian authorities.



Photograph by Dr. E. W. Brandes

THE SEPIK, SEEN FROM ABOVE AMBUNTI, TWISTS AND TURNS THROUGH THE JUNGLE

about 80 or 90 miles from the point we reached on the Ok-Tedi just a month before.

After replacing our starboard exhaust manifold, which had practically fallen to pieces and permitted sheets of flame to lick up along the fabric when idling, with one improvised out of corrugated roofing iron, we started up the river with the Government station, Ambunti, as our objective.

Ambunti is the one other settlement on the Sepik. It also has a white population of three, consisting of a district officer and his assistants. This is the farthest inland police station of either territory, being about 260 miles from the mouth of the river (see pages 317-319).

Flying up the Sepik, we passed over many villages, all recognized by Father Kirschbaum, who had visited them.

Topographically the region is unlike that drained by the Fly. The river passes through a gap in a range in the vicinity of Ambunti. Beyond this, as one goes inland, the country again becomes level and a vast plain spreads in view; but mountains can be seen in every direction at all times.

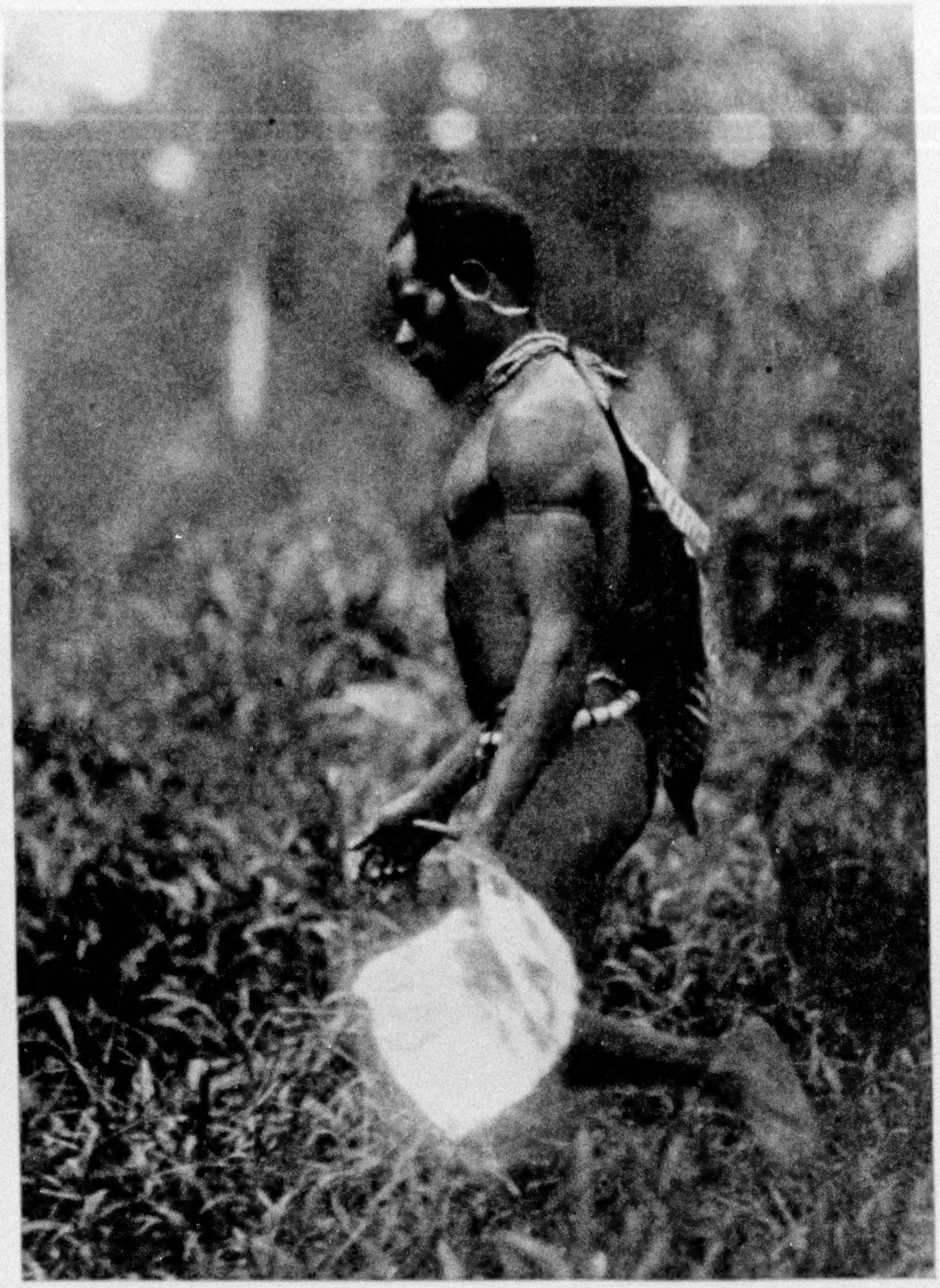
The next change of significance along the river is afforded by the foothills of the central mountains, succeeded by range upon range of gradually increasing elevation, finally culminating in the majestic splendor of the Victor Emanuel Range. Altogether, it is a far more varied prospect than the prairie of the first 400 miles up the Fly.

The flora, as seen from a mile up, is also different. Instead of the broad ribbon of tall jungle marking the course of the Fly, we saw here small, isolated islands of timber irregularly disposed throughout a sea of grassy plains.

We landed in a beautiful cove at Ambunti and were met by the district officer and his two aides, whose only compensation for their lonely existence must be the unique experience that is theirs.

We pushed on next morning, and in a little more than two and one-half hours were beyond the frontier and over Dutch territory, close to the tall mountains. For the last 100 miles all human habitations were built singly, in small clearings back from the river, or on the tops of the hills at elevations of two to three thousand feet or more.

The river here was narrow and by the force of the current churned to a milk-white fury. We circled into Dutch New Guinea not 20 miles from the source of the Mambaramo, the third great river of this island; then recrossed the border and landed above a house from which natives had been seen fleeing.



Photograph by Dr. E. W. Brandes

A TINFOIL FILM-PACK WRAPPER IS A GREAT TREASURE TO THIS SEPIK RIVER NATIVE

A NAKED SAVAGE HELPS TO SAVE THE PLANE

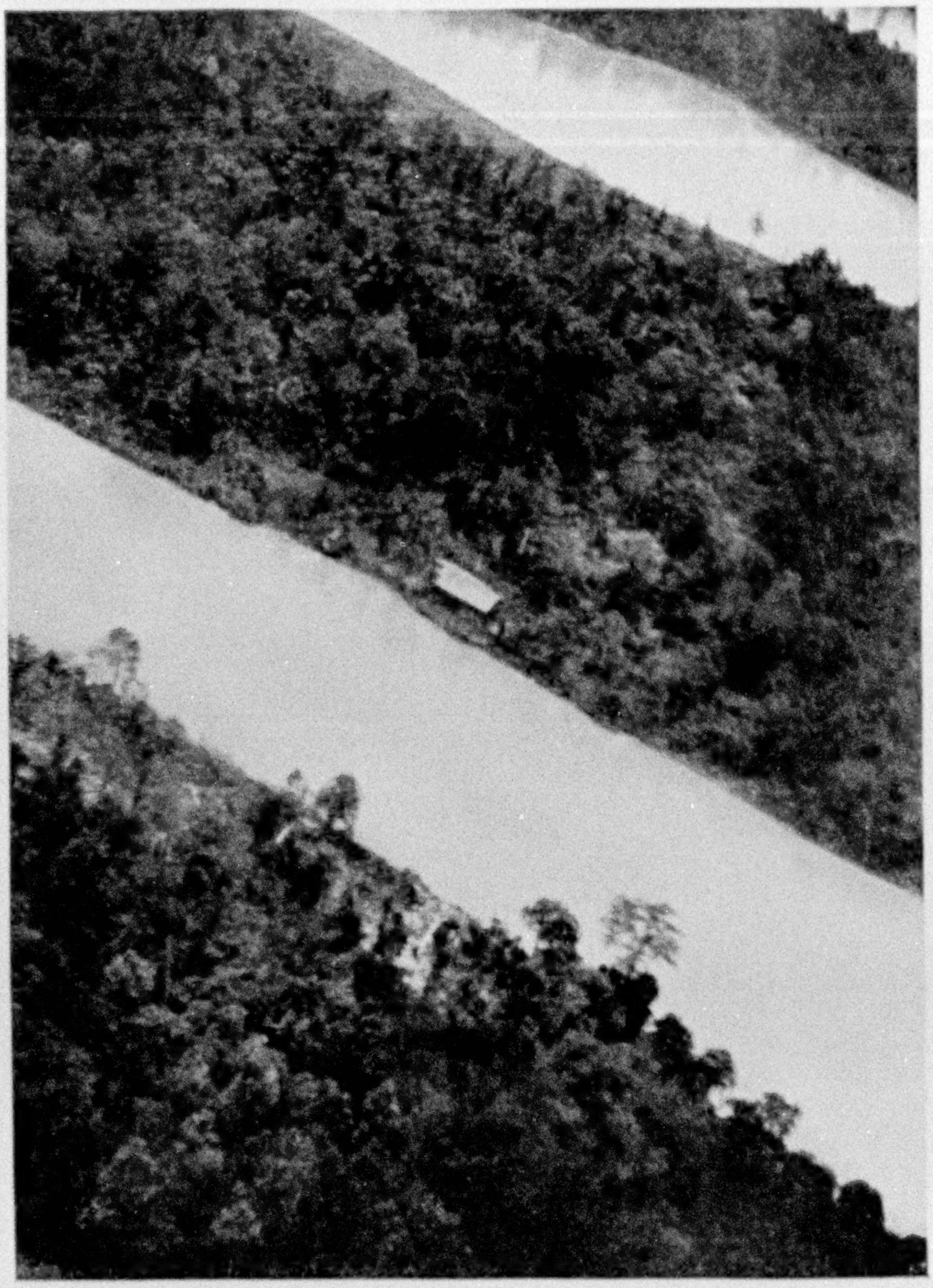
Our experience in mooring was nearly tragic. It was my job to heave out the mud hook; but, with ten fathoms of line out, there was no check to our headlong course down the river. Another ten fathoms were added, making a total of 120 feet, but with similar results. An odd piece of line from the pontoon was hooked on and we came up with a jerk, but began to swing crazily in arcs, from one bank to the other, in a pendulumlike motion.

Each time we approached a bank it seemed that the wing tips, projecting far out, would be crushed against the tree trunks; but each time they missed by a hairbreadth. The strain on the anchor rope made it sing and we expected to see it snap any minute. It was physically impossible to shorten the line paid out, and we lost ground every time we tried it. Likewise it was impracticable to swim ashore with a rope in the fierce current, as the swimmer would have been swept quickly downstream.

Desisting in our efforts momentarily, we saw a naked individual standing right at the water's edge, not more than 100 feet away, regarding us with a ludicrous expression of fear and amazement. I cannot imagine why he had not joined in the headlong flight of his fellows. In our entire experience this was the only wild man who had ever actually stood his ground during our approach (see page 321).

But it was providential for us. When we motioned him to take a rope and secure it to a stump, he actually did so. From the moment we took notice of him, this fellow threw back his head and uninterruptedly trumpeted in a nasal tone of peculiarly full, round but penetrating timbre, extending his arms to us in a supplicating manner all the while.

We discarded the idea that he was more courageous than the others and decided



Photograph by Dr. E. W. Brandes

THREE CONVOLUTIONS OF THE CROOKED UPPER SEPIK APPEAR AS PARALLEL WATERCOURSES

On the jungle-choked river bank, 600 miles upstream from the sea, stands a small village. Here the river is very swift.

that he was merely a mental case, but an extremely useful and accommodating one. We stepped ashore with a bag of trinkets and rewarded him with an assortment of beads and fishhooks. He accepted them without leaving off his peculiar calls, with his almost prehensile lips extended like the bell of a clarinet. The sound carried through the jungle for a great distance; it soon became evident that he was signaling to the deserters, who doubtless were watching from a safe distance.

We indicated by signs that we were thirsty and hungry, and with the aid of a coconut husk showed a preference for that happy combination of meat and drink. This was a lucky gesture, also, and obviously it was viewed by anxious eyes peering at us unseen from the jungle; for soon five or six men came from all directions, bearing a propitiatory offering of coconuts. They placed these on the ground near us and then retired to a safer distance—all but the trumpeter, who now desisted from his musical "Whoooooooo" and regarded us attentively.

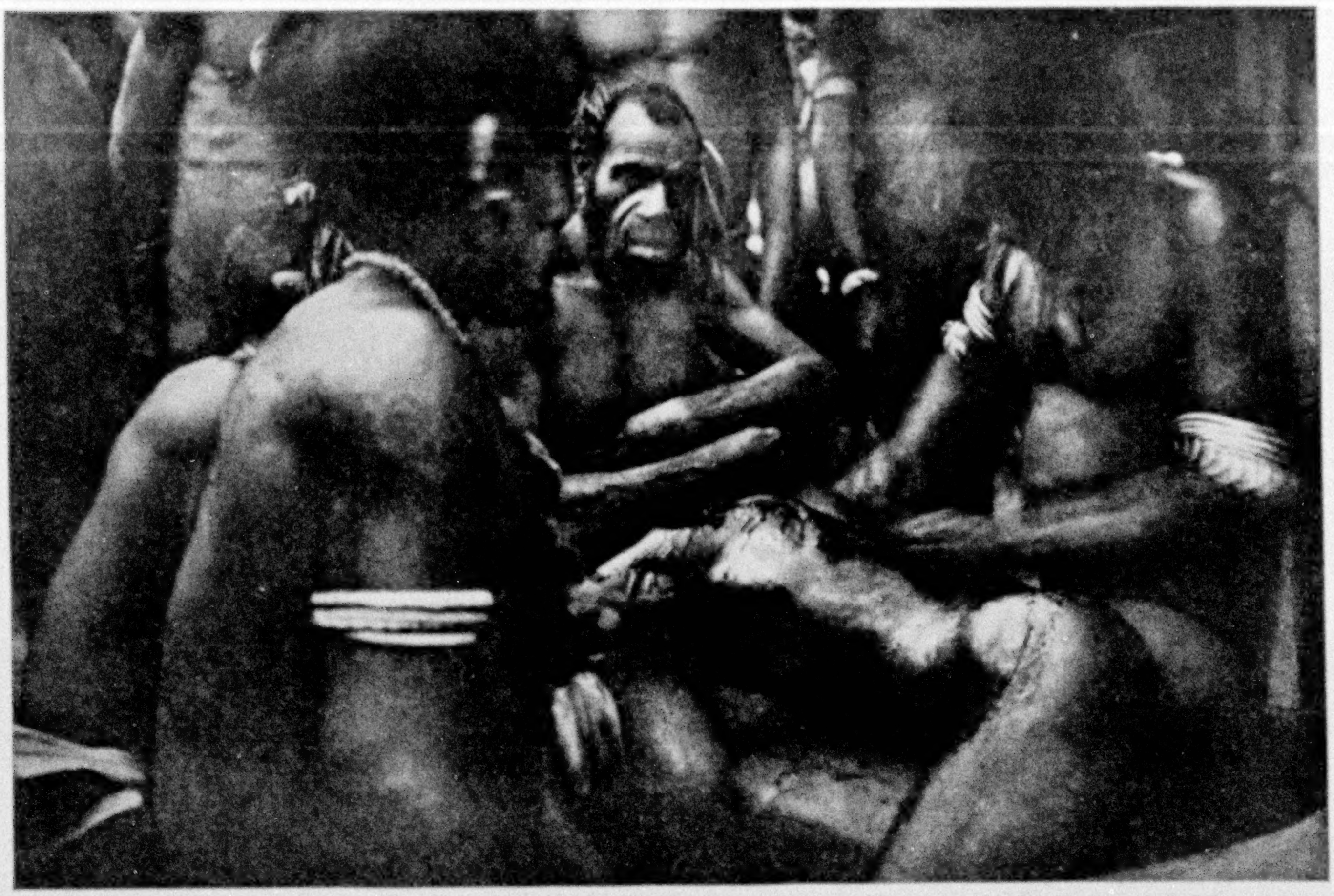
We in turn could now observe the natives in some detail.

Most of them were nearly black, but two or three were chocolate-brown and all except two wore full beards. The hair was kinky to wavy and seemed to indicate that the people here are not racially homogeneous.

SEPIK SAVAGES REGISTER EXCITEMENT BY GOURD-RAPPING

The men wore ornaments of pig vertebræ strung like beads, necklaces, and girdles mostly, but also suspended singly or in crossed pairs from the shoulders, so that they resembled the Sam Browne belt or a pair of "galluses." The most distinctive article of personal enhancement was the long, attenuated gourd worn as a sort of apron by the men.

In place of the long-drawn-out whistle with which the middle Fly natives expressed astonishment, these men would rap violently on this gourd with the finger nails by holding the index finger on the ball of the thumb and releasing the muscular tension suddenly, like a small boy shooting marbles. At every fresh evi-



Photograph by Father F. J. Kirschbaum

IN SUCH TRIBAL INITIATION RITES MEN OFTEN DIE UNDER THE KNIFE

Because mortality is so high, the "candidates" are frequently unwilling to submit and must be held. This sanguinary ceremony, photographed on the banks of the Sepik River, does not differ materially from the preparations for a feast on human flesh, in which the victim is dismembered and the various parts of his body are wrapped in banana leaves and cooked in covered pits with heated stones.

dence of the white gods' magic we would be treated to a chorus of raps like the rattling of castanets.

NEW SUGAR CANE WITH GARNET-RED FLESH IS FOUND

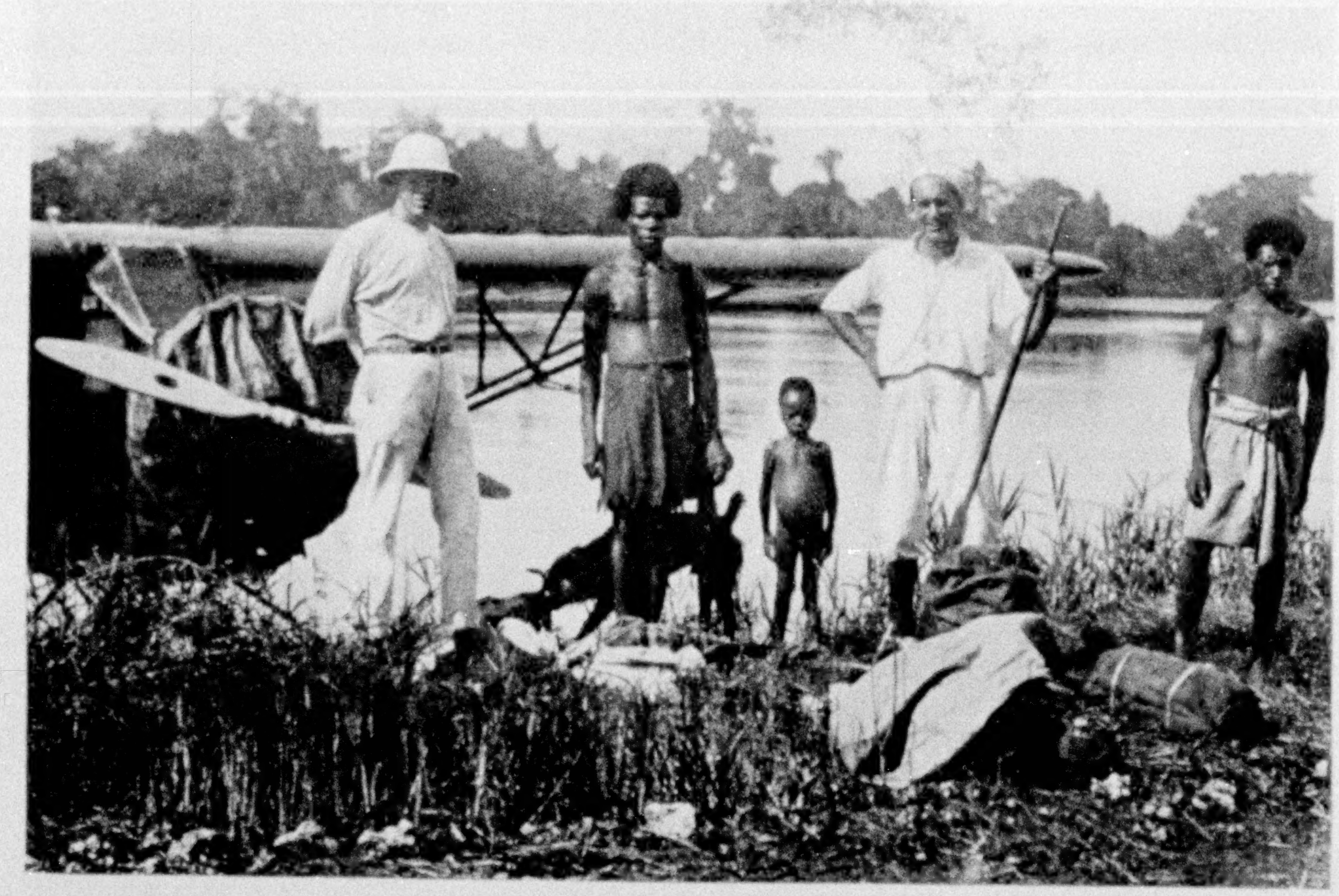
Their pipes were long tubes of bamboo. Because of the extreme timidity of these wild creatures, I attempted to gain their further confidence by taking advantage of their taste for tobacco, plants of which were seen in the clearing. After rolling a cigarette and presenting it to a man, much after the fashion of enticing a wild alley cat to come for a bone, I struck a match to the accompaniment of a symphony of gourd rapping. Finally, after he had ducked away several times, I succeeded in lighting it for him. Then his face fairly beamed, and for the next half hour I was pressed into service as official cigarette roller for the entire village. When they inhaled they sucked in the breath so sharply through their teeth that they sounded like a flock of birds singing.

On this trip a wild sugar cane of considerable interest was discovered. The flesh, from rind to center, was a deep garnet-red, and the plants were unusually vigorous, but deficient in sugar.

In one village near Ambunti neither men nor women wore coverings of any description. We did not land there, but later got pictures of some of the men at Ambunti, where they posed for us. They are of an extremely bestial type.

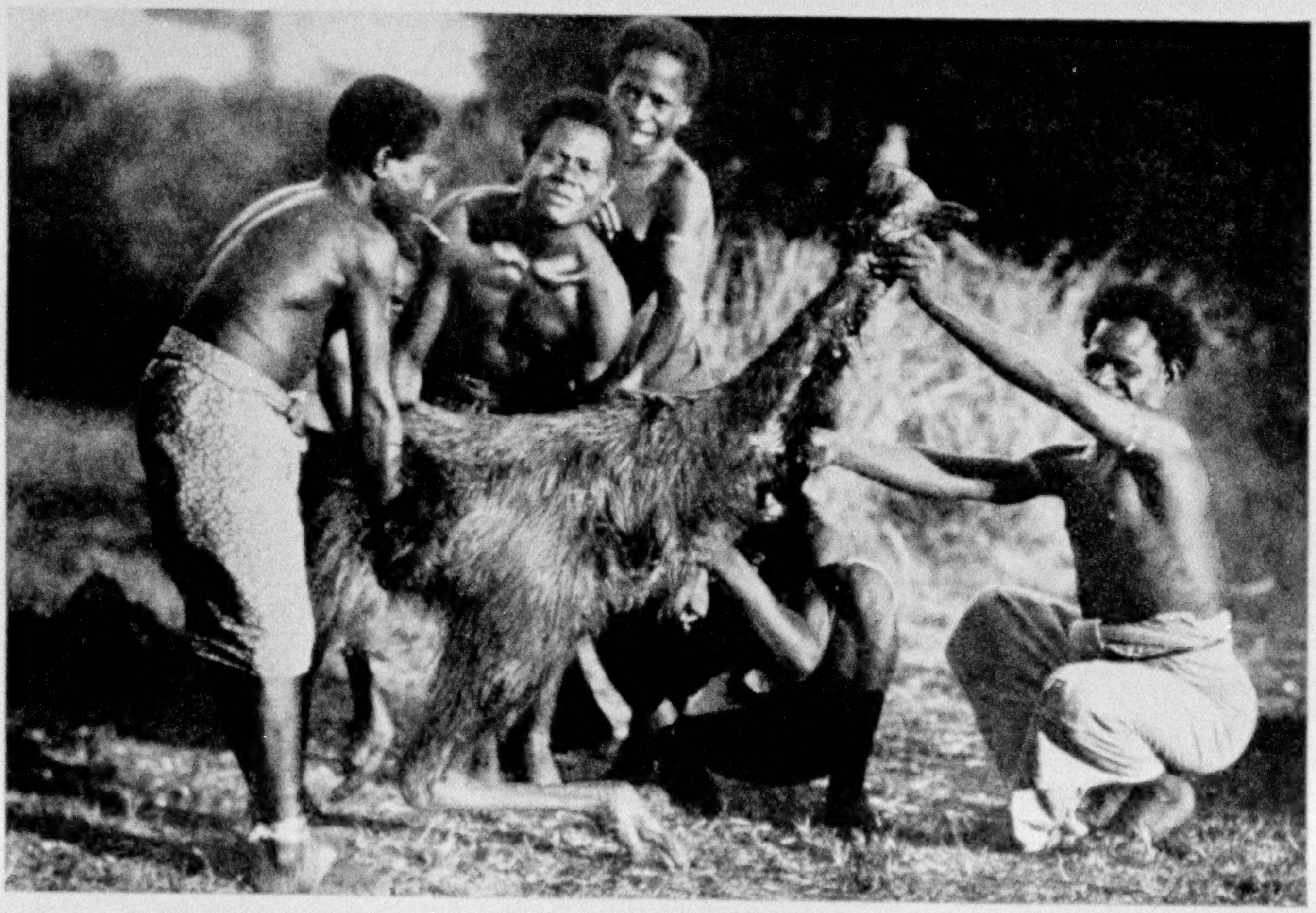
On the other hand, the material culture of some of the Sepik natives is of a high order. Despite this, they are cruel, bloodthirsty savages under the skin, and a short time before our arrival a group from one village raided another and secured 23 heads as trophies.

We landed at a number of these middle Sepik villages, some on the river and others on small marshy lagoons or lakes. A fair proportion of the natives of this region had seen white men before, as labor



BROTHER JOACHIM (LEFT) WAS A BUTCHER BEFORE HE BECAME A MISSIONARY

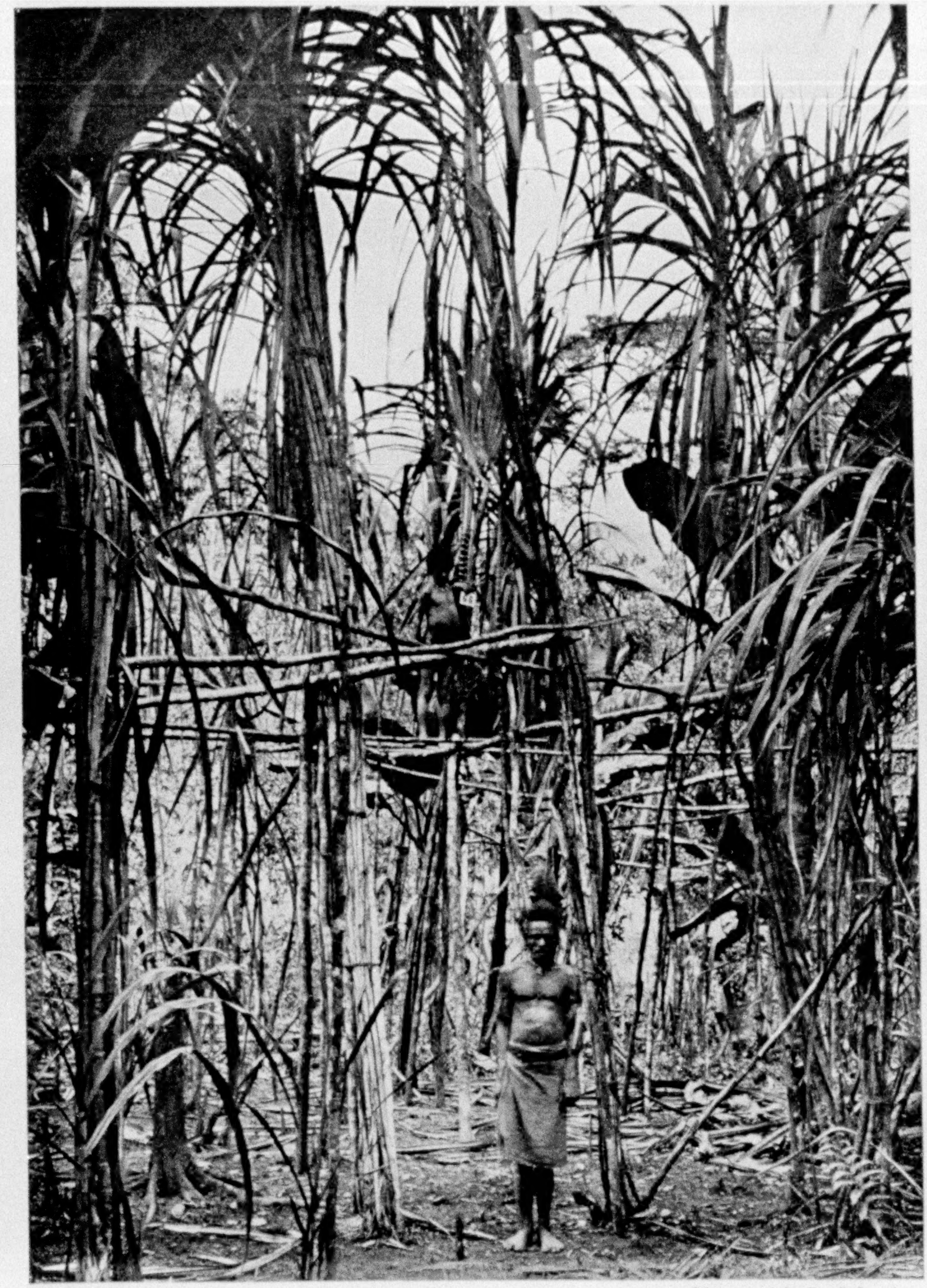
At the right stands Pilot Peck. It was Brother Joachim who resumed his earlier calling to make cassowary sausage for the members of the Expedition (see below).



Photographs by Dr. E. W. Brandes

FIVE NATIVES DISPLAY A CASSOWARY

This giant fowl, from whose claws arrow heads are made (see illustration, page 295), was shot in the jungle behind the Marienberg mission house, 60 miles above the mouth of the Sepik River. From the flesh Brother Joachim (see above) made a supply of link sausages, the only food the Americans had during several flights.



Photograph by Dr. J. Jeswiet

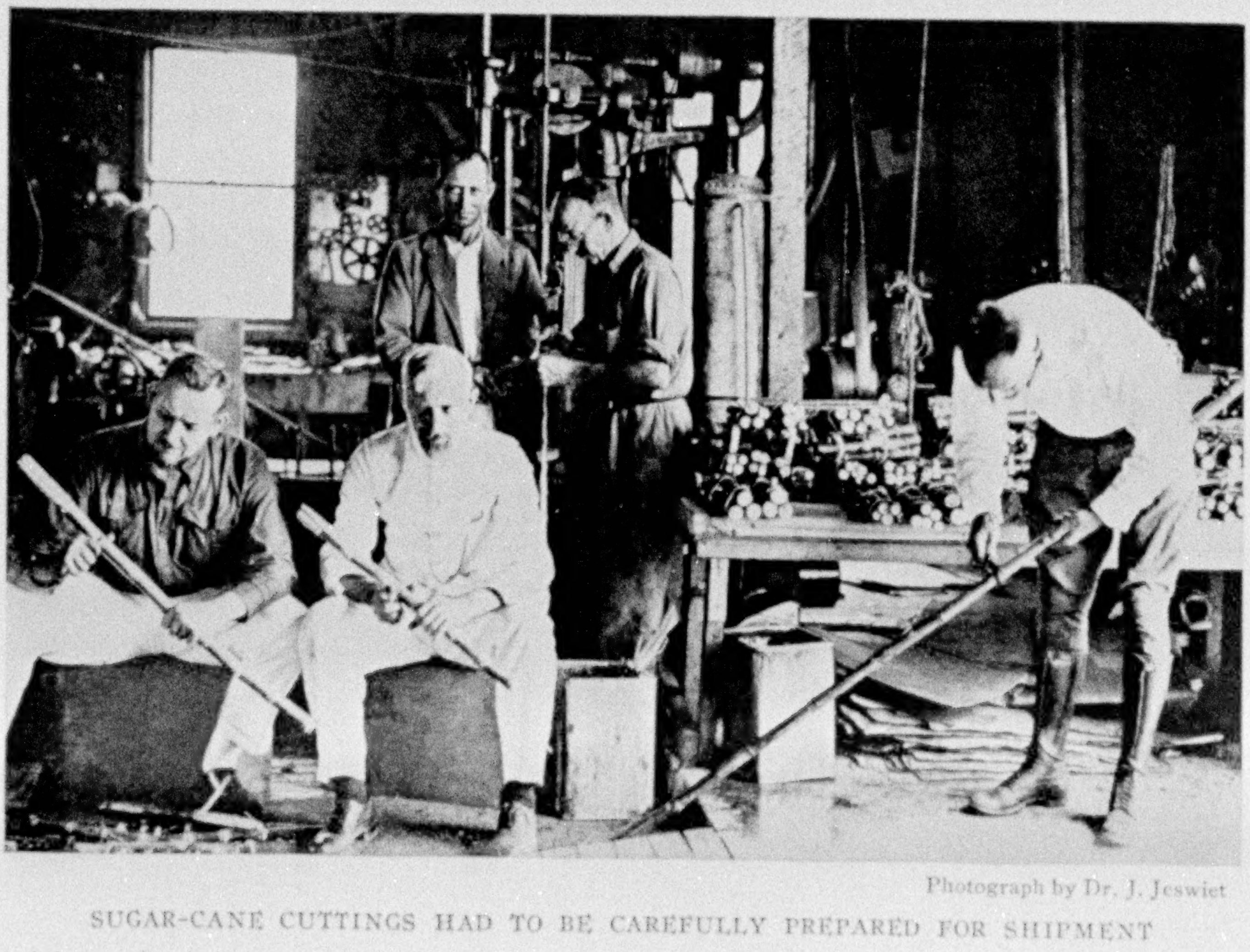
A SUGAR-CANE GARDEN IN THE VILLAGE OF BARATAKA

For protection during growth, preparatory to cutting and shipment, the cane stalks are tied to long poles set in the ground beside each hill. Boys climb up to horizontal connecting poles to clean the cane and keep it tied to the uprights. Note the identifying serial number of one of the 130 varieties of cane brought back to America. Barataka is a mountain village inland from Rigo.

Photograph by R. K. Peck

MAKING CANE JOINTS READY FOR THEIR LONG VOYAGE TO AMERICA

Of course the Expedition had to be on its guard against any harmful insects that might stow away on cane specimens. Here Mr. Pemberton is seen trailing a dangerous parasite, while Dr. Jeswiet and his "boy" look on.



Photograph by Dr. J. Jeswiet

SUGAR-CANE CUTTINGS HAD TO BE CAREFULLY PREPARED FOR SHIPMENT

Adventuring by seaplane, canoe, or on foot into jungles in quest of cane was not the only serious task. Infinite pains were taken in packing to keep cane joints alive.

recruiters occasionally go up the river as far as the Government station, and of course the three Government officers and Father Kirschbaum circulate among them to some extent. It should be remembered, however, that the region in which they operate is about the size of the State of Pennsylvania and is bordered on the south by a great unexplored area, the one we had just glimpsed from the air. Consequently we were looked upon even here as objects of great curiosity.

A description of one middle Sepik village will suffice for all.

NATIVE CLUBHOUSES 50 FEET HIGH AND 150 FEET LONG

The natives of Jaurangei, which is built on a long, crescent-shaped lagoon, 30 minutes by air downstream from Ambunti, had seen the airplane as it passed high over their well-concealed retreat on its way to the vast, silent interior; so they were not entirely unprepared when it reappeared and descended from the sky to the placid water of the lagoon.

As we taxied toward the bank a large crowd of naked black men, with here and there a striking, ghastly specimen painted chalk-white from crown to heels with pipe clay, assembled on the beach to receive us.

The main feature of the village is a series of three great structures, spaced about 500 feet apart, in a straight line through its center. These are the house *tambarans*, or clubhouses, of the men of the different clans comprising the village. Unlike the dubu houses of the Fly or the ravis of the Papuan Delta country (see text, pages 269 and 275), they are not dormitories, but are for ceremonial and other meetings, and are used also as repositories for sacred objects.

These buildings are about 50 feet high and 150 feet long, made of thatched palm sides and roof on a framework of more or less artistically carved logs of enormous size and length. The posts that support the roof at either end are carved like totem poles, to represent men and beasts, from base to peak, terminating 50 to 60 feet above the ground in a carved hornbill posed for flight. This portion projects six or eight feet above the ridgepole, which is lashed to the post.

Invariably the lowest figure represents a nude woman, the buttressed roots of the tree from which the post was taken nicely adapting themselves to represent her extended lower limbs. These carvings are not at all crude, but indicate a fine perception of anatomical detail on the part of the artists.

The earth floor of the tambaran is compacted by the tramping of countless feet, so that it is almost as hard as cement. Here are stored the drums, made of hollowed logs 8 to 12 feet long and 3 feet in diameter. A slot 6 inches wide extends nearly to the ends of the log, and from this narrow aperture the woody interior has been laboriously chipped out, leaving a hollow, resonant shell.

The ends of these great drums are artistically carved in the form of birds, reptiles, or men. To sound the drum, a heavy pestle-shaped club is inserted in the slot and the anointed priest of the drum moves up and down its entire length, as he rattles it against the lips of the slot, producing a deep-throated percussion that carries for a prodigious distance in the stillness of the night.

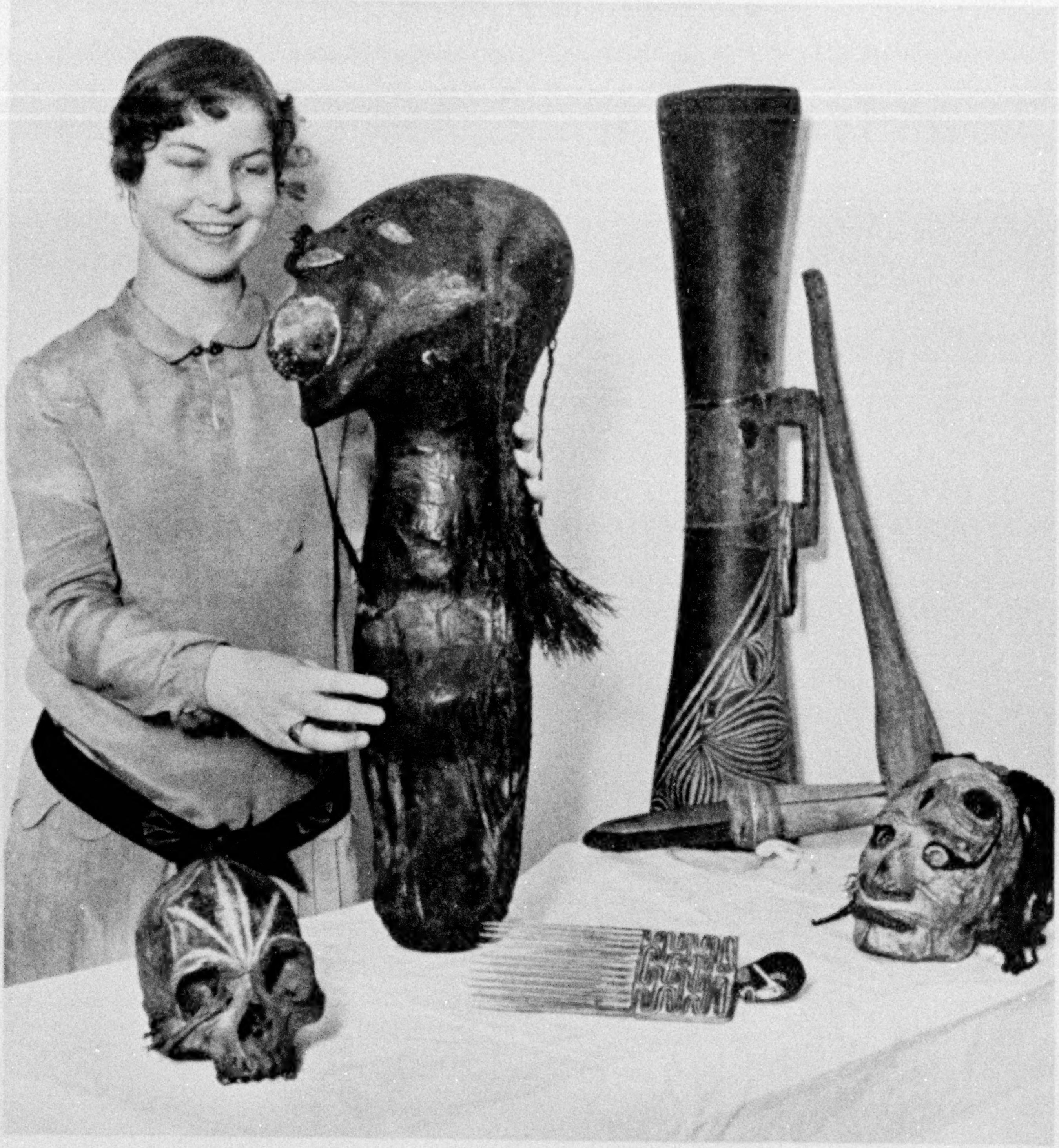
When eight or ten of their drums are sounded in unison, the noise is deafening.

DRUMS, SHIELDS, AND HEADRESTS ARE ELABORATELY CARVED

A richly carved tube, constricted at the middle and roughly resembling the spindle-shaped drums, but much longer, was observed, and its peculiar use is worth recording. It was explained that these instruments are thrust into the water of the river, and upon being suddenly withdrawn they make a sound resembling that of a crocodile's call and presumably attract these reptiles to the hunters.

Immensely heavy wooden shields for spearmen, headrests for sleeping, and stools, all wonderfully carved, were seen in abundance. Suspended from the ceiling were carved wooden figures of nude men and women with clusters of wooden hooks at their feet, on which were hung miscellaneous articles of value. These figures are representations of spirits who guard the valuable objects from defiling hands.

The gable ends of the buildings were pierced with small openings, geometrically arranged and having wooden spikes



Photograph by Edwin L. Wisherd

GRUESOME ACHIEVEMENTS IN BARBARISM FROM NEW GUINEA

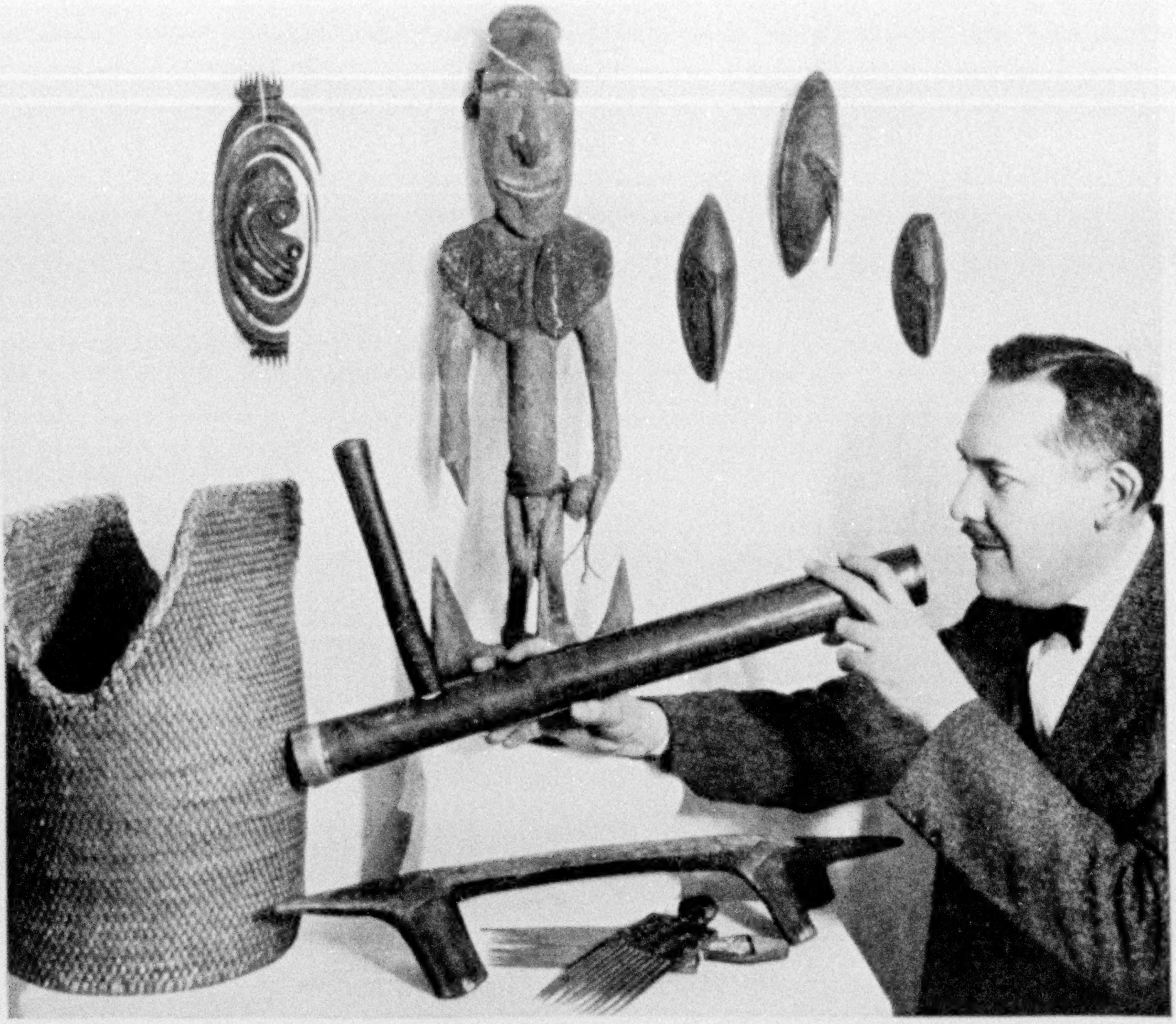
Left to right: A sculptured skull from the Strickland River country; stuffed human head from the region of Lake Murray (see text, page 295); ornamental wooden comb carved by Wussi River natives; carved wooden drum from the Ok-Tedi country; stone ax from the Fly River region; the skull of a raid victim with built-up face of painted clay, from the Sepik River (see text below).

projecting upward from the lower sills. On each spike was a grinning human skull, facing outward—a warning perhaps.

WOODEN TUBES USED AS "MOSQUITO NETS"

Of outstanding significance is the practice here of building up with clay the faces of enemies, and perhaps deceased relatives as well, on the original skulls. These curious objects are provided with cowrie shells for eyes and the natural hair is replaced. When the finished article is painted it is strikingly realistic (see above).

The most interesting single item in the dwelling is the infernal contrivance used as a protection against mosquitoes. As a rule, two or more of these "sleeping bags" are found in each house, one for each family under the same roof. They are simple tubes, closed at one end, made of



Photograph by Charles Martin

THE AUTHOR EXAMINES A CIGARETTE HOLDER "MADE IN NEW GUINEA"

These artifacts reveal the nature and degree of tribal culture in widely separated regions of the island. At the left is a cuirass of woven rattan made by the Ok-Tedi jungle pygmies; the cigarette holder is from Lake Murray. Below is a wooden neck rest or pillow from the Oriomo River. In the left background is a silhouette woodcarving from a tributary of the Sepik River, and at the right are long-nosed wooden masks representing spirits of the departed, Sepik River. In the center is a figurine with hooks for feet. Objects hung on these hooks are inviolable and may not be removed by anyone except the owner. In his observations of native customs and handicraft, the author received invaluable assistance from Mr. F. E. Williams, Government anthropologist for the Territory of Papua.

tightly woven matting and supported by hoops of split bamboo, spaced about three feet apart, on the inside, throughout their length. The average size is 10 feet long and 3 feet in diameter. There is no supporting hoop at the open end and it is merely collapsed on the floor at this point.

The householder, with his numerous wives and children, enters this almost airtight torture chamber on his hands and knees and swelters in the foul air in preference to being devoured by mosquitoes.

We caused a great commotion in one of these peaceful dwellings by taking motion pictures of routine activities of the inmates by the aid of sputtering calcium flares.

Again back at Marienberg mission, we prepared our valuable collection of plants for the return journey to Port Moresby. On the day of our return the "shooting boy" brought in a fine cassowary. This giant bird has a leg as large at the thigh as that of a man. A second cassowary, bagged the following day, was made into sausages, our food on the return flight to Port Moresby (see page 326).

Game abounds here. The cumbersome

hornbill thrashing through the air in noisy flight, the goura pigeon, large as a young turkey, and even crocodile eggs made up part of our menu. I managed to eat the crocodile eggs, but candor compels me to state a preference for the barnyard variety, served with ham in the United States.

It is amusing to add that the shooting boy had climbed to the roof of the cookhouse to get a better view of us when we made our first appearance at the mission. As we circled overhead he slid from the roof and rushed to the missionary, shouting, "Master, master, the Savior he come!"

OVER BLUP BLUP, A VOLCANIC ISLAND

Back now from exploring that dark Sepik River region of sorcery and cannibalism, our cane collection achieved, we turned our sunburnt faces homeward.

On the morning of August 3 we flew along the north coast to Samarai, a distance of about 950 miles, arriving in the late afternoon. On this trip we passed a strange volcanic island, which rises from the sea between the mouths of the Sepik and Ramu rivers. It is known to natives by the onomatopoetic name of "Blup Blup." It was erupting at the time and showed evidence of two recent lava flows on the landward side.

From Samarai we took off early next morning for Port Moresby. Clouds had not yet mantled the interior mountains. So, to our astonishment, we could now see that a month before, on our blind flight across the island, we had actually hopped over the highest point of the whole central range of mountains! Without suspecting it, we had missed the peaks by only a few hundred feet!

At Port Moresby our final collections of cane were prepared for shipment, and soon we were aboard a convenient tramp on our way to Sydney. As many of the cane cuttings had started to sprout, we had to improvise a garden on deck. At Sydney, also, as a precaution against loss, a complete duplicate set of our collection was planted in quarantine, in fields provided by the Colonial Sugar Refining Company.

From Sydney we brought our cane to Vancouver, and thence by rail to Washington. At Vancouver, also, our plane was put on wheels and flown over the Rocky Mountains, arriving at our starting point, Washington, D. C., just 200 days after our departure. Incidentally, I later used that same plane for making aërial pictures of Lake Okeechobee and the Everglades in Florida.

NEW GUINEA CANES NOW FLOURISHING IN WASHINGTON, D. C.

In quarantine greenhouses at Arlington Farm, across the Potomac from Washington, we planted our cane collection. A fair proportion of the varieties which survived the trip are now vigorous young plants. Those which failed to survive the long trip are being replaced from our intermediate depot of duplicate plants propagated at Sydney.

About 130 distinct varieties of sugar cane, selected with a view to disease-resistance and adaptability to conditions in the Gulf States, resulted from this expedition. It remains now to test these plants under the conditions of commercial cane culture in the South. Superior varieties will eventually be developed by a series of carefully controlled tests and distributed to sugar planters.

It is conceivable that some of these varieties, propagated on a commercial scale, will eventually reach proportions gigantic in comparison with the limited amounts found in their native habitat. Thus we see that races of plants, like races of people, may migrate from one far part of the world to another to multiply and replenish the earth.

Notice of change of address of your NATIONAL GEOGRAPHIC MAGAZINE *should be received in the office of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your November number, the Society should be notified of your new address not later than October first.*

THROUGH JAVA IN PURSUIT OF COLOR

BY W. ROBERT MOORE

"A CUP of Java and a couple of buns" was one of the first morning calls that I answered behind a restaurant counter on an odd-job venture in my early school days. But for the man who associates Java with a cup of good coffee alone, a visit to that Garden Isle is a delightful revelation.

Marching the length of Java in search of interesting subjects for my color camera, I found a long panorama of fascinating attractions. There were innumerable wide fields of waving sugar cane, with busy refineries in their midst, and everywhere rice fields were checkerboarding the valleys or stair-stepping in terraces up the volcanic hillsides. Into the market places came huge piles of cassava roots, from which evolve our tapioca puddings, and beyond the roads were cinchona plantations, destined to produce quinine to combat the world's malarial fevers.

It was a fast-moving procession of ancient Hindu temples, quiescent and erupting volcanoes, batik workers, *wayang* dancers, and *gamelan* orchestras; of olive-skinned Javanese in bright sarongs laughing on their way to market, plantations of rubber and coffee, and large hill areas, where Dutch planters were reading fortunes in cups of pekoe tea, but with far more accuracy than ever did my aged grandmother.

THE START FROM SINGAPORE

But to begin: It was a starlit night, soft and caressing from a breeze after a tropical shower, when our ship lay at anchor in the open roadstead at Singapore harbor. Between us and the sparkling lights of the city rode ships from the far ports of the world, sailing under a score of different flags. Among them were brightly lighted steamers from London, bound for Sydney or Shanghai; from New York girdling the globe; from Kobe, Amsterdam, and Naples; and close ashore were hundreds of bobbing Chinese sampans and high-pooped junks lighted with smoky coconut-oil lamps.

Our anchor chains rattled, and with the steady throb of the engines we swung toward the Southern Cross and cleared for Batavia, leaving behind the cosmopolitan city of Raffles's dreams.*

Across the Equator we traveled into the Southern Hemisphere, and, after 40 hours of cleaving the smooth, turquoise sea, our ship tied up alongside the wharf at the up-to-date Tandjoeng Priok harbor, 20 minutes by motor car or electric tram from Batavia.

MOSQUITOES ARE RESPONSIBLE FOR BATAVIA'S MODERN SUBURB

Docking late in the day, in a heavy downpour of rain, we asked the captain if we might spend the night aboard instead of going to a hotel, as we had to be at the harbor again early the next morning to transship our goods.

"We make no provision for people while in port," explained the captain. "It's pretty noisy, the diet is simple, and sometimes the mosquitoes bother a little," he added. "However, if you fellows are willing to put up with the fare and promise not to write anything about the mosquitoes, you may stay on the ship. Keep your cabin door closed, and if you don't turn on the lights you'll be all right."

Of the onslaughts of the mos—— (my silence is pledged). But mosquitoes, together with the swampy flats of that region, have loomed large in Batavia's history and they have built for her a new city.

Time was, in the early period of colonial development, when the Dutch came out to Batavia they brought their love of the lowlands with them, and there built closed houses on the canals, which ran through the low, swampy land. But, as trading men and soldiers died by thousands from malaria and other diseases induced or aggravated by the miasmic vapors which surrounded them, they eventually learned that tropical Java was not a temperate Netherlands.

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* See "Singapore, Crossroads of the East," by Frederick Simpich, in the NATIONAL GEOGRAPHIC MAGAZINE for March, 1926.

When Capt. James Cook started homeward, in 1770, from his strange adventures of exploration and discovery in the South Pacific, he put in at Batavia to repair his weathered ship *Endeavour*, and there it was that poor Tupia, his little Tahitian friend and interpreter, "died of fever, caught from the deadly climate and uncleanliness of the place." *

Batavians have since moved their residences to the near-by suburb of Weltevreden, meaning "well content," which enjoys a far more healthful climate and has beautiful, wide avenues, the broad Koningsplein, and other well-tended parks. Most of the business offices and godowns still remain in old Batavia, although branch offices and new buildings are, more and more, being located in Weltevreden.

THE TWO-WHEELED "SADOS" ARE FEATURES OF BATAVIA'S TRAFFIC

Existing alongside the fine, large stone and stucco offices and bank buildings in the old city, one can also see the cluttered quarters of the Chinese population. Motor cars, many of which come from a large American assembling plant located in the city, whirl along the excellent streets, and a clanging steam tram closely resembling George Stephenson's historic *Rocket* connects the two sections of the city. *Sados* (or *dos-à-dos*), those little two-wheeled carts where one sits chummily back-to-back with the driver, are still a popular means of conveyance.

In spite of the fact that Batavia carries on a heavy world trade, most of its business comes to a drowsy standstill for a long siesta during the heat of the day.

Leaving Batavia, we shipped for Soerabaja, along the northern coast of the island, dropping in at Semarang on the way long enough to load a dozen lighters of freight and exchange a few passengers. Although Semarang proudly asserts that it is the third city in Java, Batavia and Soerabaja each greatly outdistance it in population and shipping figures. The business district is the usual odd mixture of buildings common to Eastern ports, but the color of the market day in the native *passar* lured me beyond sane reason to try many snapshots of the comely, olive-cheeked maidens and wrinkled matrons. The results, however, were largely hopeless blurs, as the women dodged about in their stalls of vegetables or hid their faces from my camera lens.

At the approach to Soerabaja, in the bright sunlight of early morning, we saw the beautiful smoky-blue masses of the Tengger Mountains, with the volcanic cones of Ardjoeno and active, mist-capped Semeroe notching the sky to the south. The ship crept up the river mouth past the huge dry docks and the expanding harbor works to the wharf. With the exception of Singapore, Soerabaja can accommodate ships for repair better than any other place in the East Indies.

But big, modern Soerabaja, with its up-to-date automobile salesrooms, radio shops, department stores, and palatial residences along its shady boulevards, is a poor place for a person seeking camera studies of native Java. So we sat in a hotel one afternoon, where Dutch people lounged about the verandas clad in gay, starched pajamas and flowery kimonos, discussing whether or not our itinerary should include Tosari hill station and the erupting Bromo Volcano.

"I've never been there, but I doubt if it's worth it. Anyway, it's uncertain weather," volunteered an American business man.

"But it is recommended by the tourist bureau," I said.

"Yes; so did an overenthusiastic Dutchman once walk me for a whole morning to see a waterfall not ten feet in height," he complained.

UP TO CLOUD-ENGULFED TOSARI

Yet we went. An hour on the morning express to Pasoeroean and 24 miles by motor road, which zigzagged in dizzy hairpin curves up the steep 6,000-foot mountain side, through tall casuarina woods, and we reached cloud-engulfed Tosari.

When the fog turned to rain, as the afternoon wore on, and I shivered all through the long dinner hour in spite of my top coat, I went to bed under all of the blankets I could find and heartily agreed with the American in Soerabaja—

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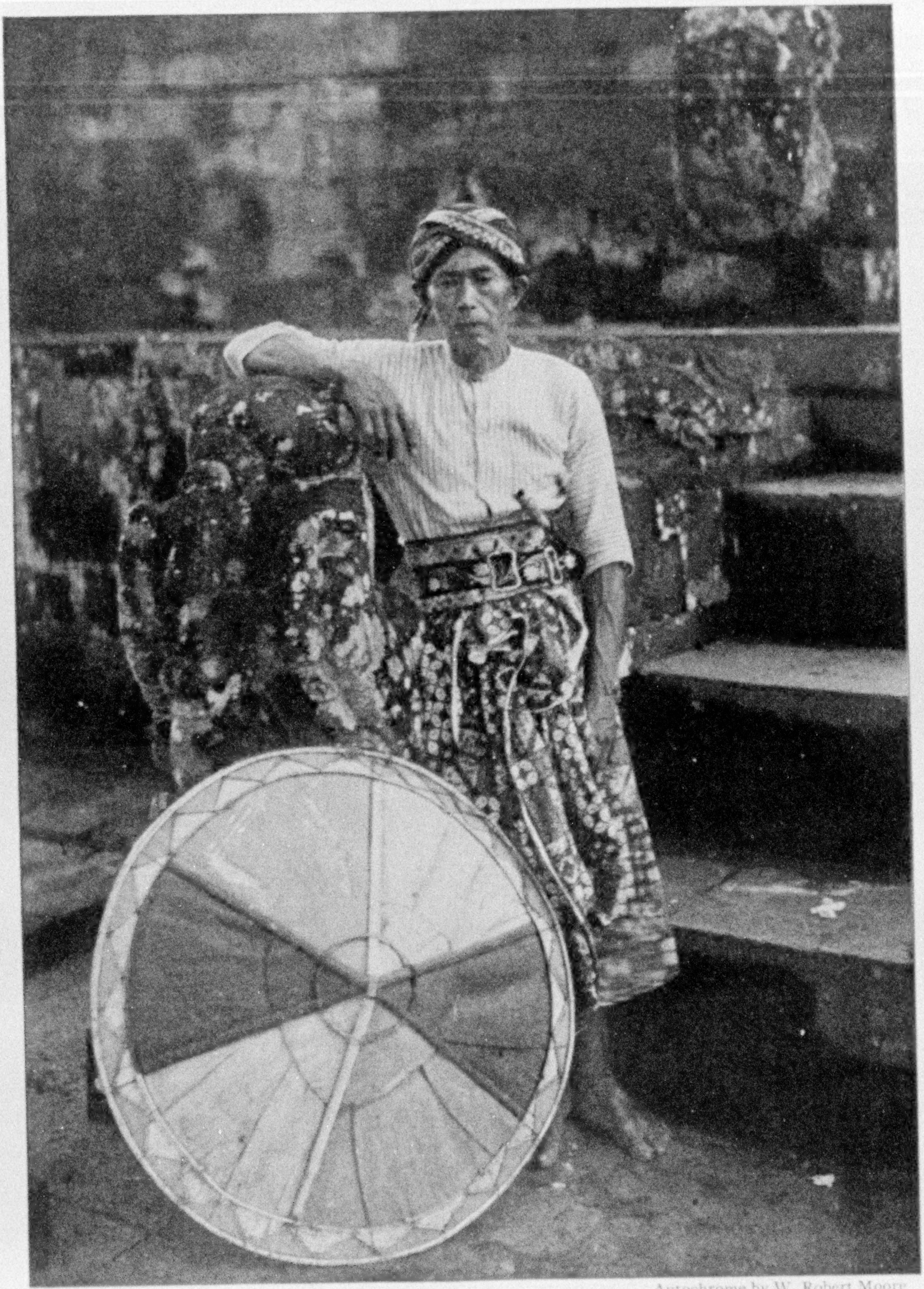
* See, also, "The Columbus of the Pacific," by J. R. Hildebrand, in the NATIONAL GEOGRAPHIC MAGAZINE for January, 1927.



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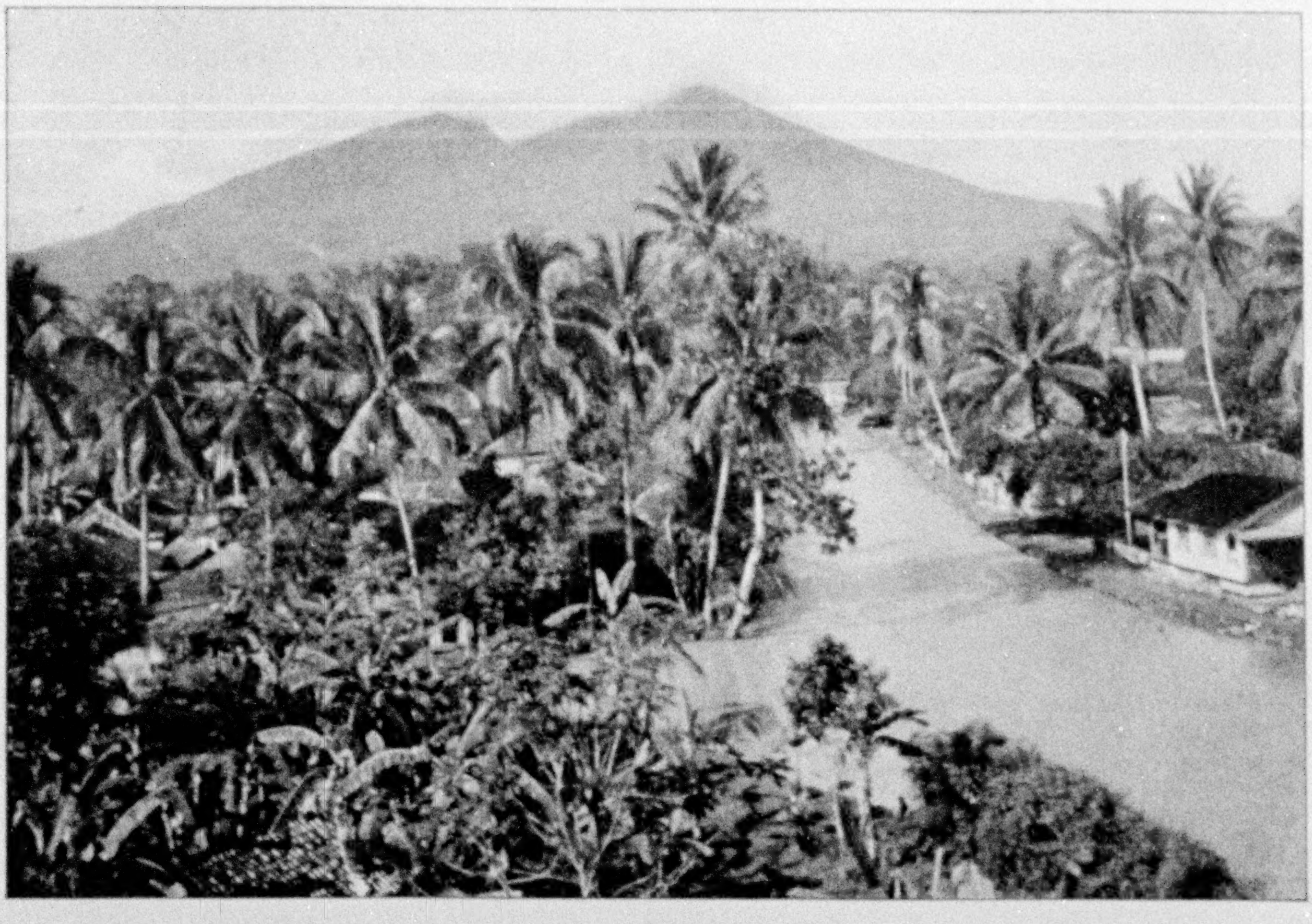
Autochrome by W. Robert Moore

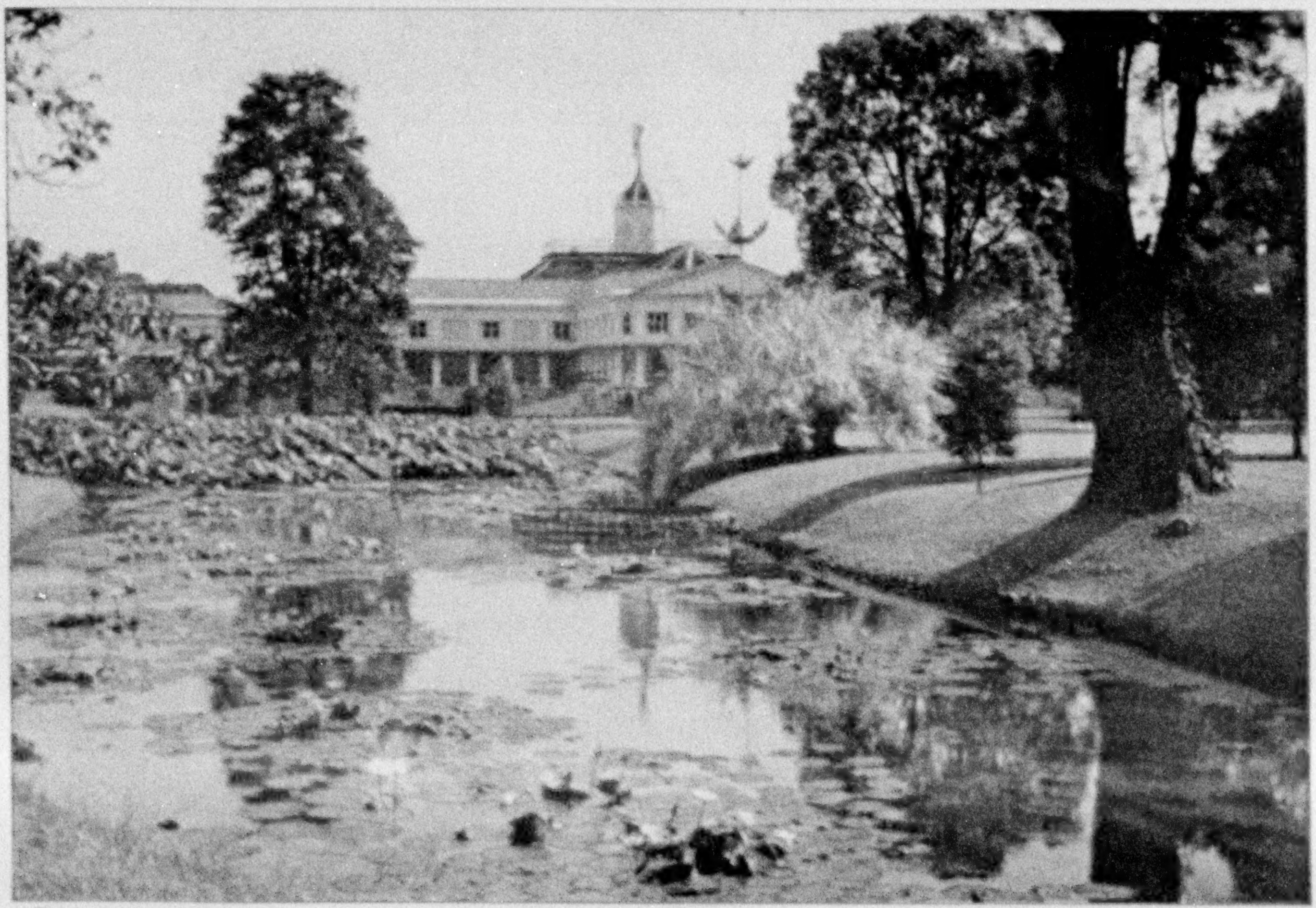
A VENERABLE GUARDIAN OF THE SACRED TEMPLE OF A THOUSAND BUDDHAS

Many centuries ago, before the Mohammedan conquest, Boroboedoer's magnificent monument was raised. As a structural achievement it rivals the Great Pyramid and its sculptures record the artistic and cultural development of Java's golden age. The timeworn gentleman with "sunshade" hat at his feet guards the precious ruin against desecrations of vandals and souvenir hunters.



CLOUD-CAPPED SALAK LOOMS ABOVE A SEA OF VERDURE

An excellent climate has made Buitenzorg the island's country capital, where the Governor General, and such other officials as can, seek surcease from the heat of Batavia. Coconut palms border the muddy river which flows through the city, and on the near-by slopes of Mount Salak, tea and coffee plantations flourish.



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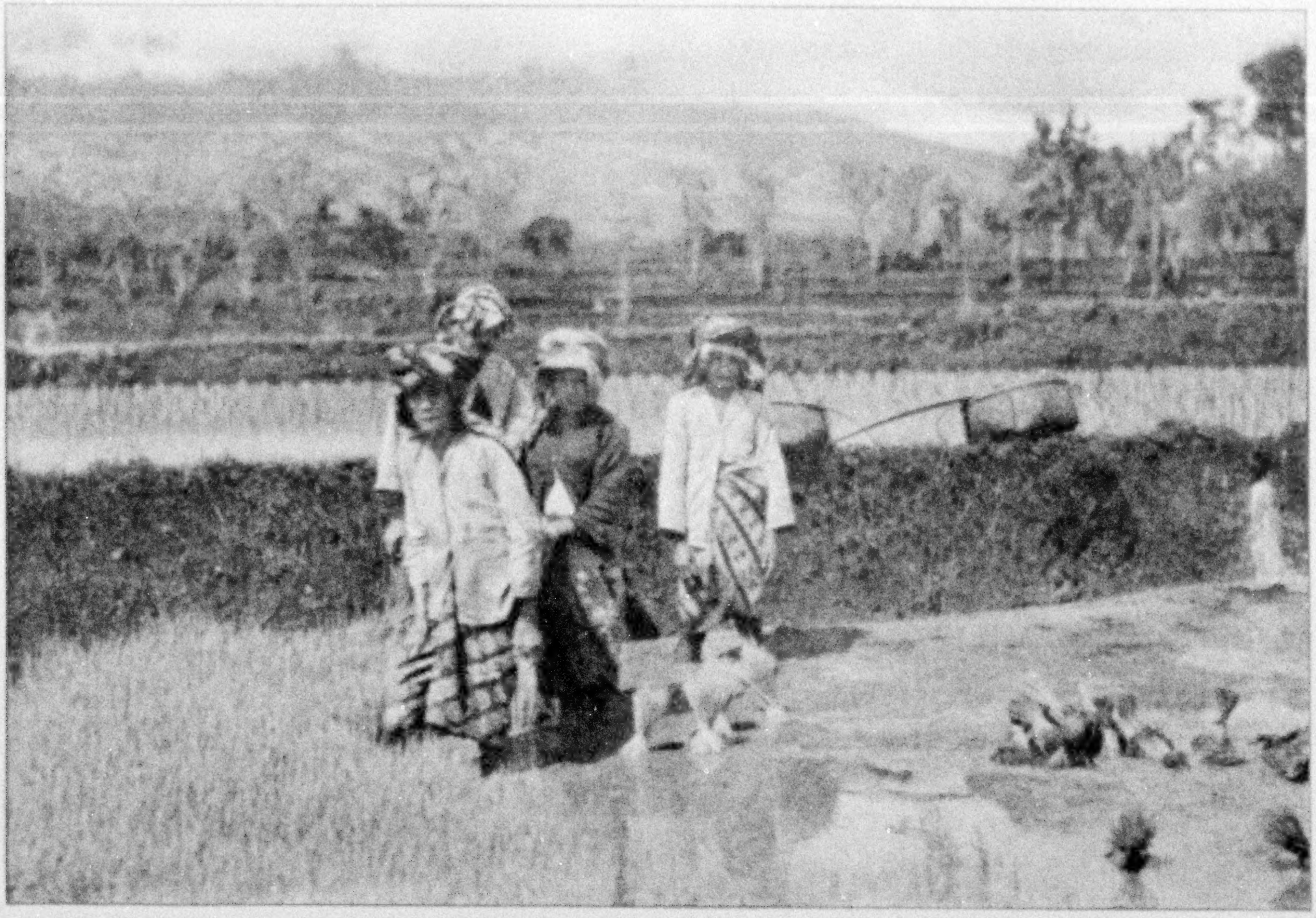
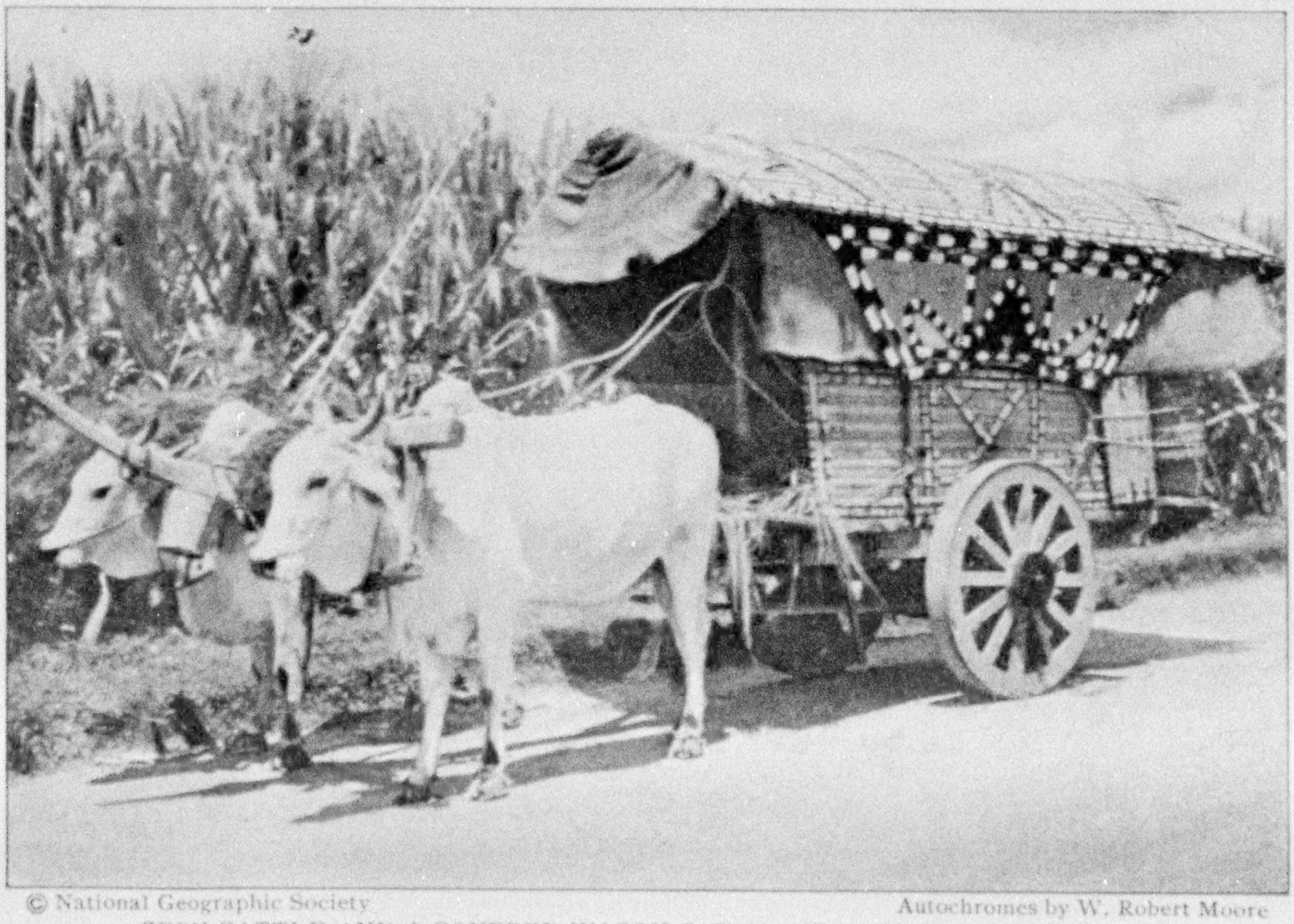
A LOTUS POND ADJOINS THE GOVERNOR GENERAL'S PALACE

Queen Wilhelmina's representative in the East Indies governs more than 50,000,000 subjects. His magnificent residence at Buitenzorg is in the midst of a botanical garden which Dutch horticultural genius, a tropical sun, fertile soil and a daily shower have combined to make one of the finest in the world.



PLAYING NURSEMAID TO A FIELD OF YOUNG RICE

Modern methods have made little impression on the Javanese rice farmers, who still cling to their age-old methods. The seed is sown in well-watered nursery beds, and after the plants have obtained a start they are gathered in small bunches and transplanted to larger fields, where they are set out about a foot apart.



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ZEBU CATTLE AND A COVERED WAGON CARRY SUGAR CANE TO THE MILLS

Java is one of the world's chief producers and exporters of sugar and the cane has been grown there for centuries. The driver of this equipage, regarding the camera as possessed of an "evil eye," stubbornly refused to be photographed and hid himself far back in the cart. At the left is a field of growing cane.

FISH MAY ALMOST BE RECKONED A FARM CROP IN PARTS OF JAVA

Along the north coast there are miles of artificial fishponds, and many a house has one in the back yard. Several varieties of carp are raised, including large goldfish which are prized both for their appearance and for their flavor. The Government encourages this back-yard fish industry.

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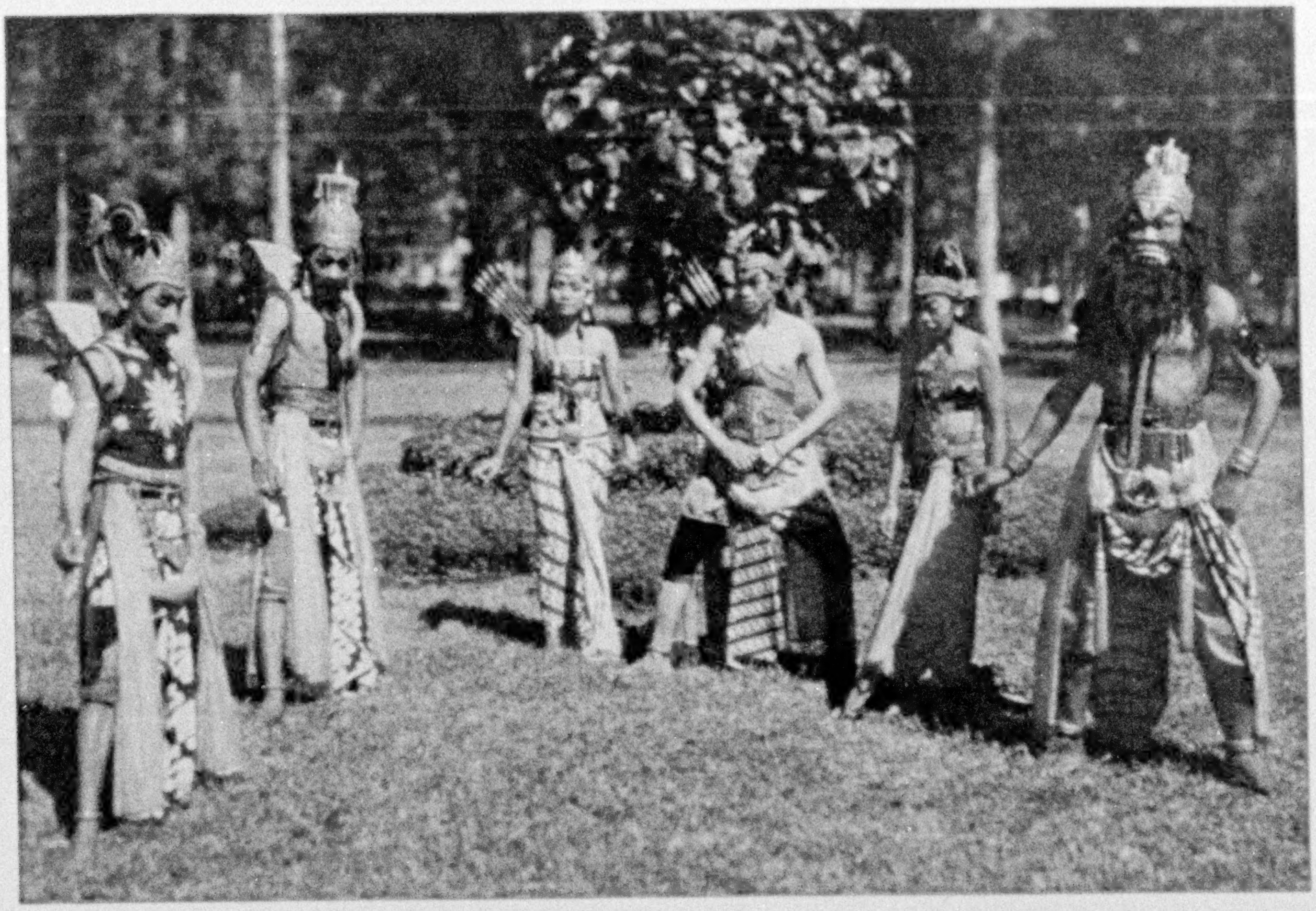
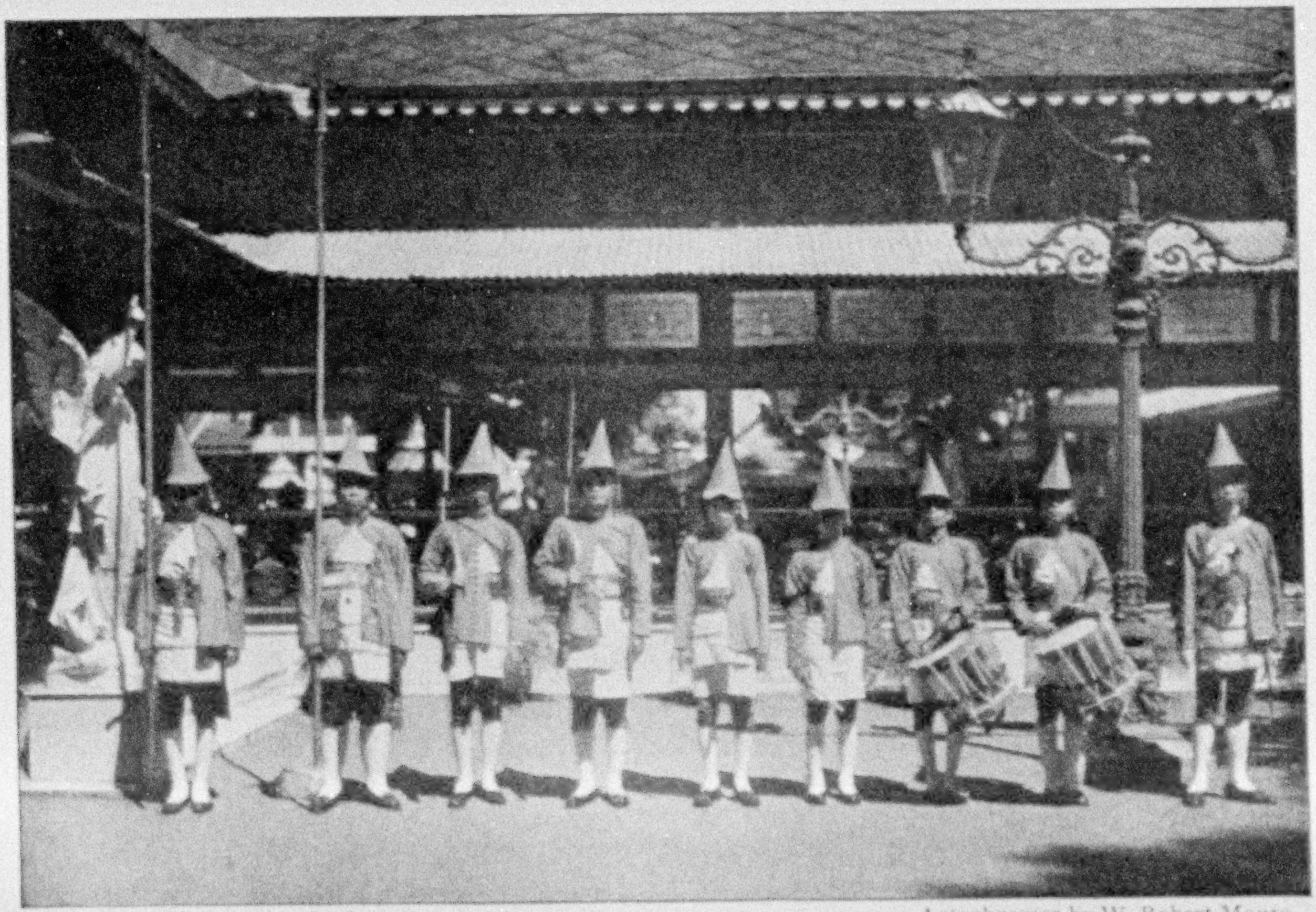
SULTANS OF OLD BUILT THE WATER CASTLE AT DJOKJA

Despite ravages of earthquakes and tropical vegetation, some of the magic grandeur of this old playhouse and sanctuary built in the middle of an artificial lake remains. A secret passage under the water led to it.



WAYANG PLAYERS ENACT MYTHS AND LEGENDS OF THE LONG AGO

While motion pictures are popular in Java, they do not command the same degree of interest displayed in the native drama, or *wayang*. The actors at the extreme left and right represent, respectively, the Sun God and the King of the Devils (see also Color Plates VI and VII).



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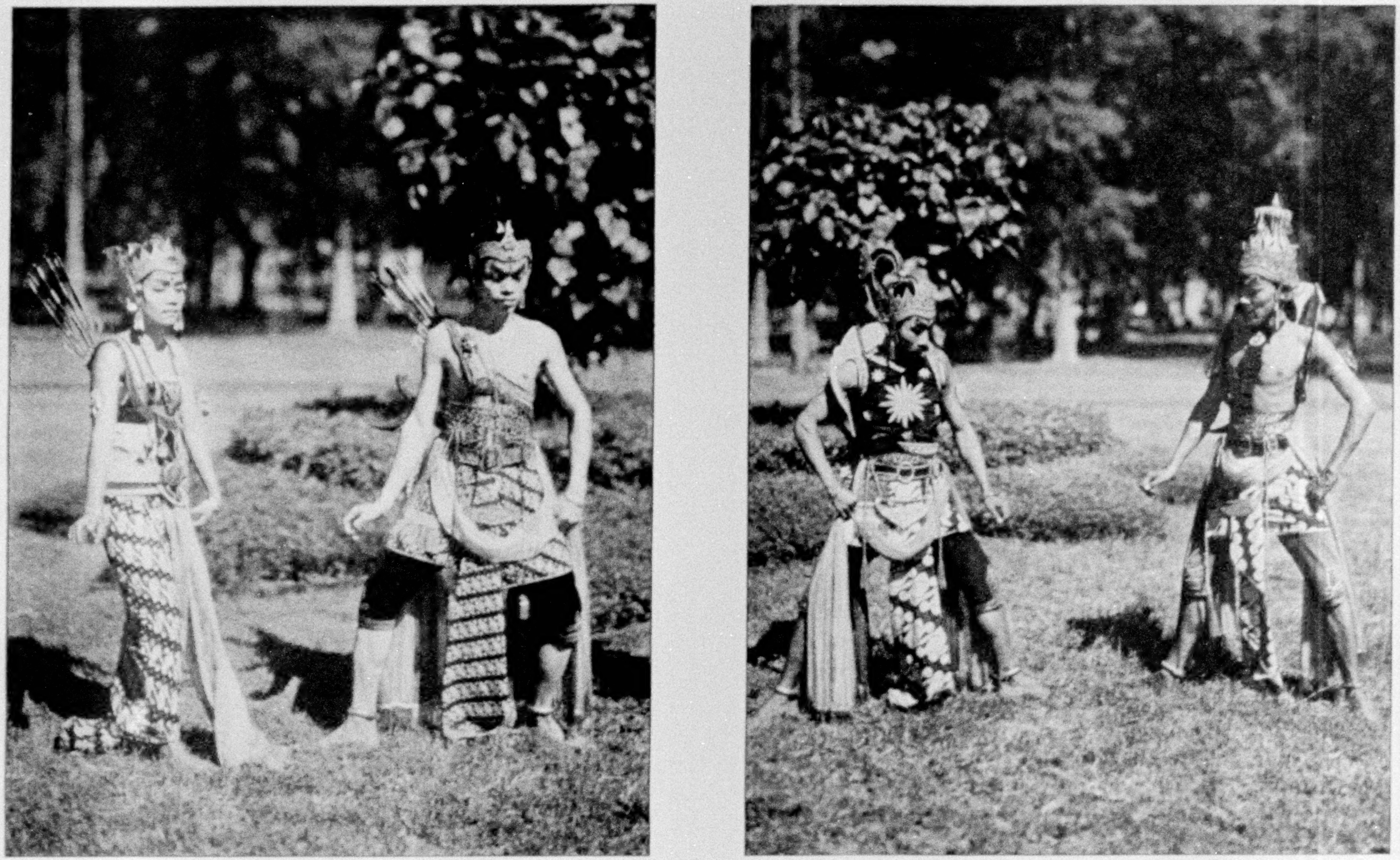
THE HIGH HAT BODYGUARD OF A NATIVE DIGNITARY

A few princes still maintain the outward show and trappings of their ancestors' estate, surrounded by numerous retainers who live within their palace inclosures, or *kratons*. At Djokja the Sultan's kraton is a mile square.



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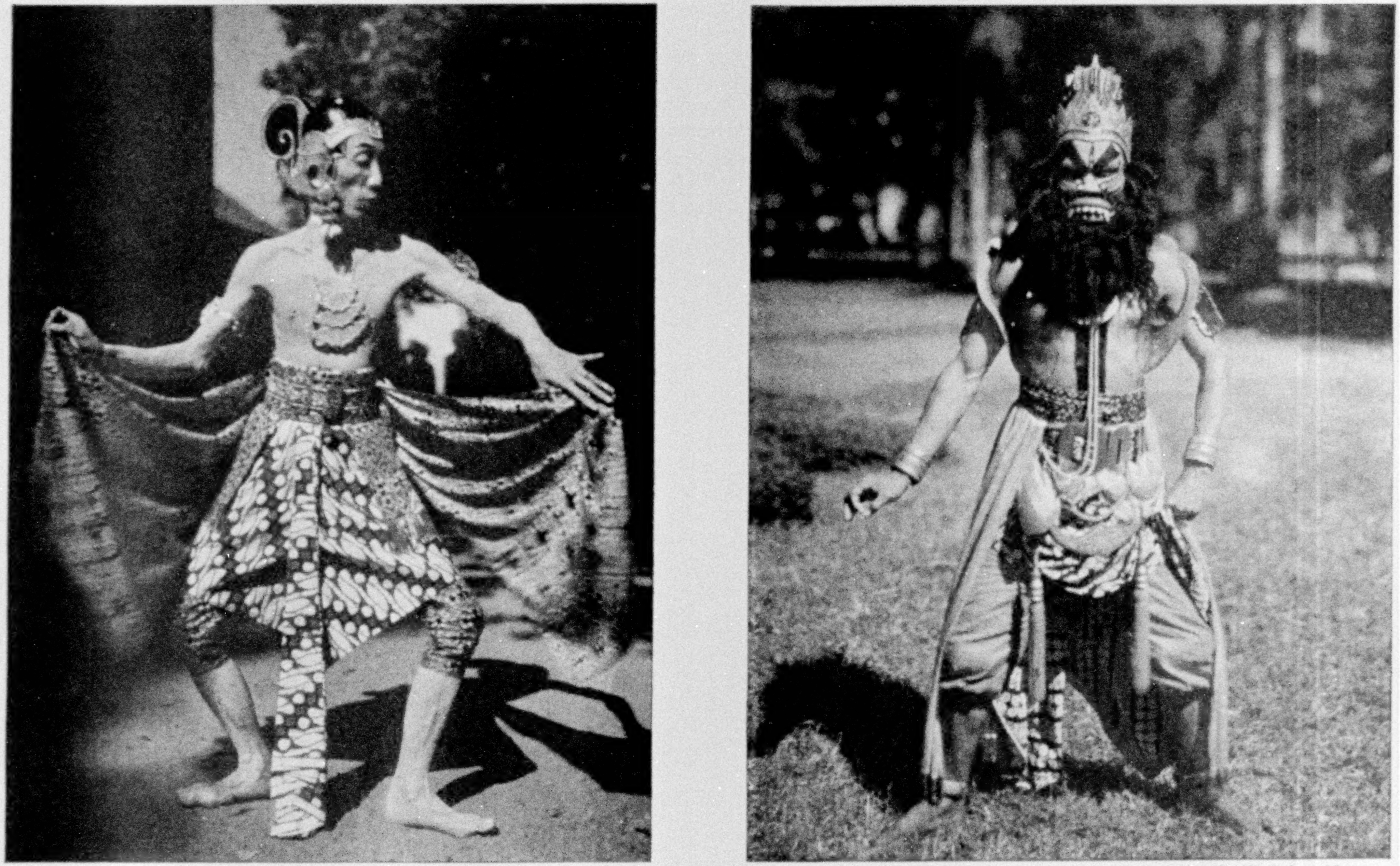
ONE MUST BE WELL VERSED IN NATIVE FOLKLORE TO UNDERSTAND THE ACTIONS OF WAYANG PERFORMERS

The plays are of two kinds, the *wayang purwa*, performed with puppets and dating back to pre-Hindu days, and the *wayang orang*, a comparatively recent development in which human actors perform. The puppet shows had their origin in a sort of shadow play connected with an ancient native ancestor worship. The shadows on the screen represented the spirits of the departed, and the plays were built up around their great and noble deeds.



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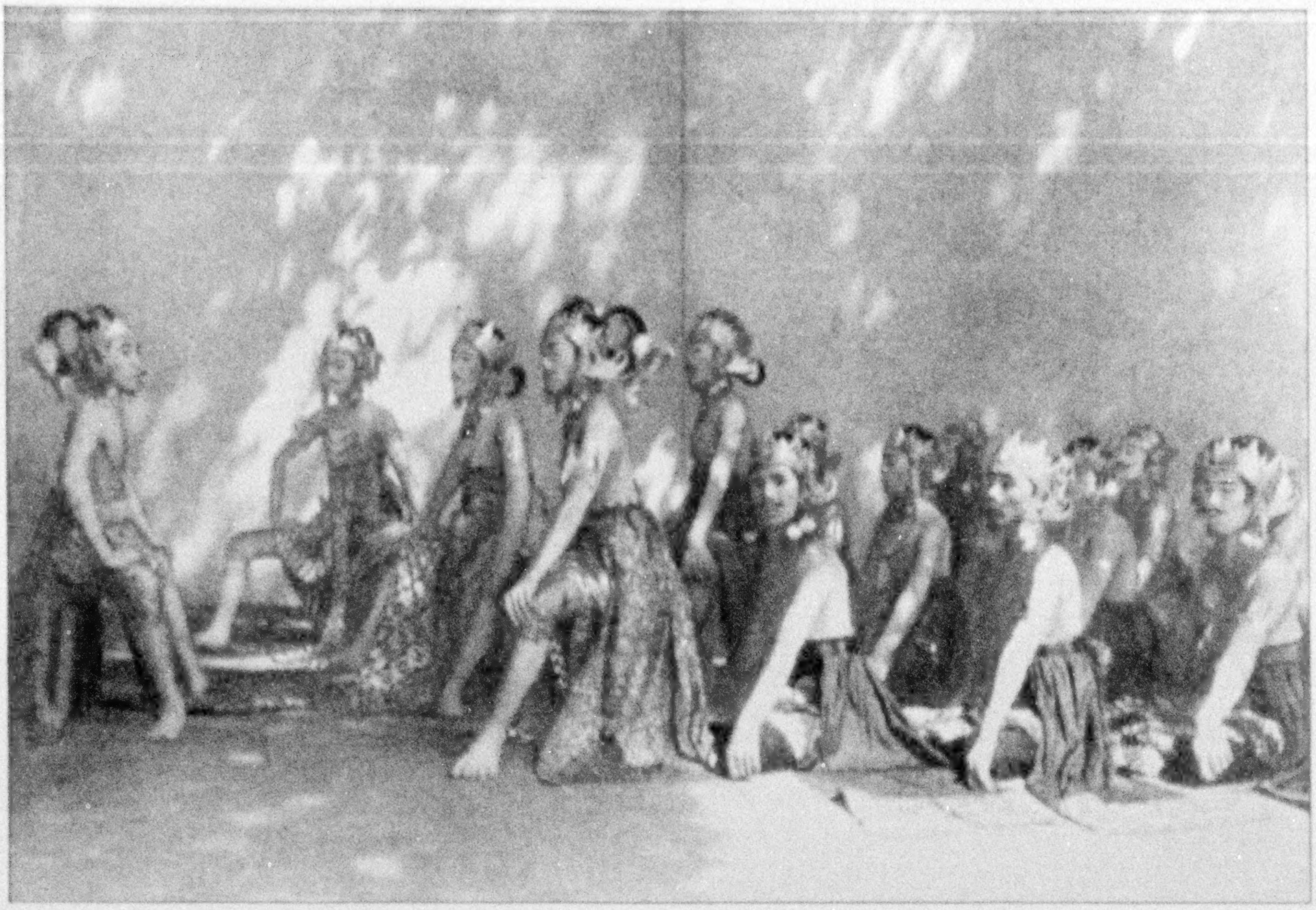
Autochrome by W. Robert Moore

JAVANESE STAGE CONCEPTIONS OF A LEGENDARY PRINCE AND THE KING OF THE DEVILS

Although not quite as popular as the puppet shows, wayang orang performances are well patronized. The actors travel about in troupes and the myths and legends they enact prove so interesting to their audiences that it is not uncommon for a single performance to last for several nights. Frequently the presentations are pantomimes and a reader accompanies the action with appropriate explanatory remarks (see also Color Plates V and VI).



A NATIVE SULTAN'S PRIVATE WAYANG TROUPE

© National Geographic Society

Autochromes by Tassilo Adam

BOY IMPERSONATORS TREAD THE SLOW, RHYTHMIC MEASURES OF A NATIVE DANCE

To the speed-loving West, their leisurely movements would probably seem a veritable slow motion picture. However, each posture assumed has a significance of its own and conveys a meaning to the interested Javanese onlooker. The seven boys are performers at the Court of Djokja.

Tosari weather certainly wasn't exactly as advertised.

Three o'clock the next morning we emerged from our hotel into a chilling dampness. The intense blackness and falling mist augured ill for our plan to see the sunrise over the famous "sand sea" and Bromo crater.

Once outdoors, we finally located the ponies awaiting us. They were in charge of two 14-year-old guides, who had their heads and shoulders muffled in blankets and resembled nothing so much as a couple of turtles drawn within their shells.

A GLIMPSE DOWN BROMO'S FLAMING THROAT

The trip to the volcano was a long, uncertain ride over a trail we could not see. Now and then we crossed ridges where cold blasts of wind-driven mist sent a chill to the bone. At other times we skirted a sharp mountain wall. On the other side was only the blackness of night, except where scattered groups of twinkling lights far off below us marked the presence of villages on the plain.

Our horses frequently pitched down some unseen slippery descent or scrambled up a rocky cliff, with the guides clinging to their tails. We, poor creatures, clung to the saddles and our heavy camera cases and hoped for the best.

After traversing unforgettable miles, we reached the pass, where the trail plunges an abrupt thousand feet to the level floor of the sand sea. As we dismounted to clamber down the precipitous path on foot, the brightening dawn revealed a spectacle such as one would expect if suddenly transferred to the pitted surface of the moon (see illustration, page 344).

Once this great plain of volcanic ash, cupped in the depression between the mountain walls, formed a vast erupting crater. On the far side of the plain stands the more recently burnt-out cone of Mount Batok, ribbed as if it had been cast in a giant custard mold. At Batok's side, uneasy, rumbling Bromo acts as one of the many present-day safety valves for the troubled interior beneath the wide-stretching East Indian Archipelago.

The Dutch have in recent years built some 250 cement steps up the ashy side of Bromo. We climbed to the top and looked down into the yawning, sulphur-coated throat of the crater, where old Vulcan's blast furnace was roaring and spouting tongues of flame. Pungent sulphur-laden gas and steam came seething upward, and as the vapor plumed into the sky it caught the golden light of the morning sun.

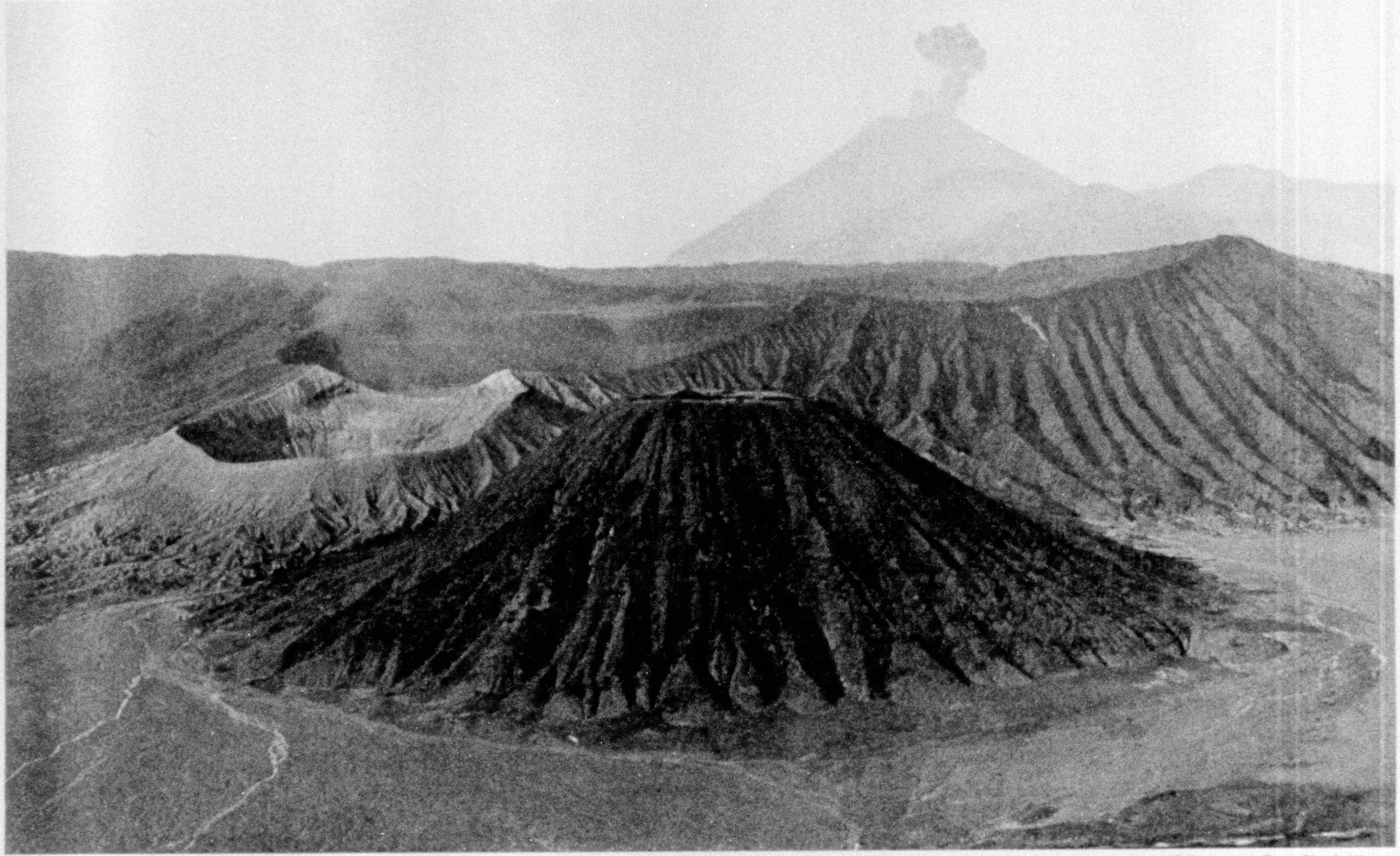
It is told that the natives in the region hold Bromo sacred. Formerly once each year they were accustomed to cast a young maiden into the flames as a propitiatory offering to the god within. In these later days of Dutch influence offerings of chickens and corn have taken the place of human sacrifice, and some of the daring young moderns, I learned, even climb part way down in the crevices and cheat the fiery god by rescuing the offerings for themselves.

As I worked under the focusing cloth of my camera on the narrow crater rim to get photographs of the glowing pit, my companion saw the ashes crumble around the tripod and expressed his conviction that I would shortly be the next sacrifice to the temperamental god. Our young guides wanted us to toss in a few coins as an offering. They then crawled a little distance down the crevices into the crater to show us their bravery and to suggest the acceptability of a reward. Later, presuming beggars, they ate our morning lunch that we had entrusted to their care.

Before the late morning clouds again obscured the hillsides around Tosari, we saw that those sheer heights were almost completely under cultivation, as indeed we found nearly all mountain sides on our rambles across the island. It is much as the old Michigan farmer once said of his hilly ground: "It's turned up edgewise, so you can farm both sides." The rich soil of the island is a great volcanic ash heap, and this is one of the chief reasons for Java's fertility and prosperity.

THE RICE TABLE'S DELIGHTS

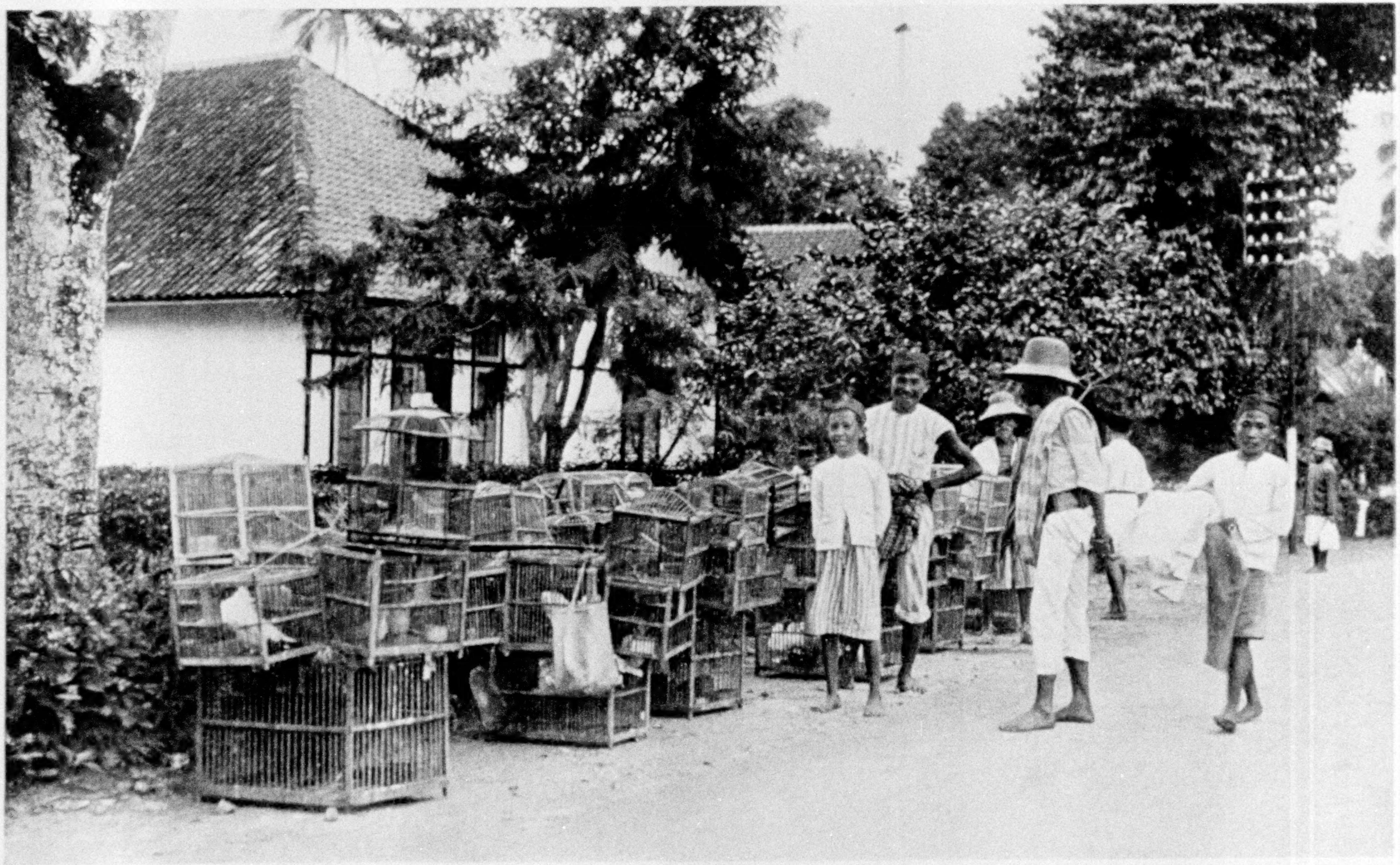
We hurried back through Soerabaja on our way to Soerakarta (Solo). Of our stay in the former city, I shall long recall our first introduction to the *rijst tafel*, or rice table. When the hotel boys pushed in two taxis, as they jokingly called the serving wagons, laden with condiments,



Photograph from Helmig and Co.—Kurkdjian

WITHIN JAVA'S VAST TENGGER CRATER LESSER VOLCANOES HAVE BURST FORTH

No more extraordinary panorama of weird and fantastic volcanic scenery exists anywhere else in the world. In the central foreground is the symmetrical cone of Mount Batok. In the left middle distance is Bromo, into whose seething pit at one time were hurled human sacrifices to the Fire God (see text, page 343). The smoking cone in the background is lofty Semeroe.



Photograph by De Cou from Galloway

BIRD AND CHICKEN PEDDLERS ALONG A JAVANESE HIGHWAY

Few indeed are the native homes in Java that have not some variety of feathered pet. Frequently a dove will be kept in a cage, which is raised each morning to the top of a high pole (see text, page 346). If the family goes on a journey, the bird goes, too.

Photograph by W. Robert Moore

GREAT OCEAN LINERS CALL REGULARLY AT BATAVIA'S HARBOR

Tandjoeng Priok, the port of Batavia, is about 6 miles from the city and is connected with it by rail and a canal. The port has a system of harbor basins, some of which will admit ships drawing 36 feet of water. In a recent year more than 4,000,000 tons of shipping cleared this port.

eggs, and meats variously prepared, together with many strange things, numbering in all upward of 20 varieties, to eat with our generous helping of rice, I soon learned the cause of the extreme popularity of long siestas and oversize waistlines. Decidedly, rijst tafel luncheons are a training for one's will power and one's judgment of capacities!

Traveling westward from Soerabaja over the flat countryside, with the high backbone of volcanic ridges to the south, one passes through the heart of the sugarcane region. There are some 180 mills operating in Java, and these produce two and three-quarter million metric tons of sugar annually from the planted area of about 480,000 acres. The value represented by this one product is about 20 per cent of the exports of the whole Dutch East Indies. In fact, next to Cuba, Java is the most important cane-sugar producing country in the world. There is a large, efficient experimental station at Pasoeroean, where efforts are made to improve the cane as well as to combat its diseases.

As the train skirts the sugar town of Modjokerto one has to remind himself that the city was at one time decidedly more on the map than it is at present, for it was once the seat of the mighty Hindu Empire of Majapahit, which extended over Java and Sumatra. But, like many early capitals in other lands, only a few foundations and broken stones strewn about mark the historic ground.

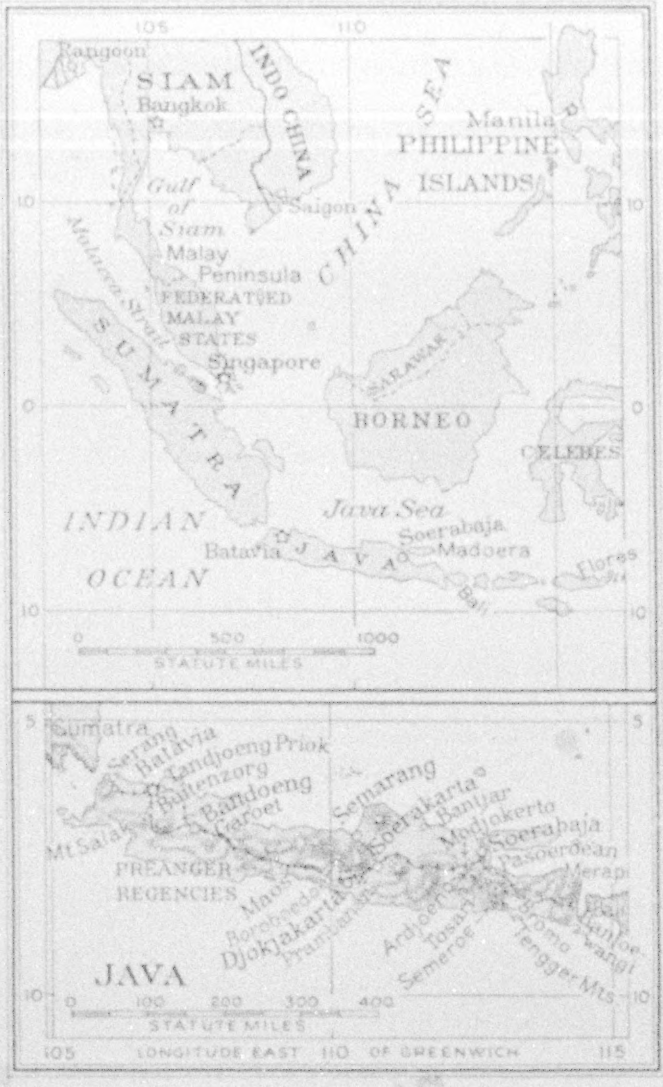
A BIRD CAGE FOR EVERY HOME

I had begun to doubt that Java (including the closely adjacent island of Madoera) had the large population of 727 people per square mile that is ascribed to it, because I could not see their *kampongs,* or villages, but I was ready to acknowledge almost any total of bird farms. On these, unfortunately, I could discover no statistics, but I saw hundreds of cages hanging on tall poles above clumps of green bamboo and among the towering betel palms.

Then I discovered my error. The native kampongs of the rural districts are hidden within those very bamboo thickets! Almost every native household has one or more cages of turtledoves or ring-tailed pigeons. Every morning the cages are pulled up on the poles and are brought down to the house again for the night.

The wants of a Javanese in regard to his home seem to be satisfied easily, for his house is usually built with walls of woven bamboo and the roof is thatched with leaves from the nipa palm. It is thus that someone has described him: "If a kindly Providence has blessed him with a virtuous wife, a couple of sons and daughters, a buffalo or two, and a *sawah* (rice field), the Javanese peasant has attained the zenith of his worldly desire."

Nearly all of the Javanese are Mohammedans; but in the eastern part of the island, where the Arab invasion had partially spent itself, there are still many traces of Hindu belief. Across the narrow strait, on the island of Bali,* Hinduism was never routed. The Malay mind of the Javanese, however, keeps him from becoming too fiery a Moslem, and even though some do visit Mecca, this fact does not seem to prevent many from building altars to the good and evil spirits which surround them.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110
Rangoon
SIAM
Bangkok
INDO CHINA
Gulf of Siam
Saigon
CHINA SEA
Manila
PHILIPPINE ISLANDS
Malay Peninsula
Malacca Strait
FEDERATED MALAY STATES
Singapore
SUMATRA
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Drawn by C. E. Riddiford

THE ISLAND OF JAVA, AT THE HEEL OF ASIA

With approximately the same area as the State of New York, teeming Java has three and a half times as many inhabitants. It is four times as large and has five times as many people as the Netherlands, to which it belongs.

WAYANG PLAYS CHIEF DIVERSION

The wayang plays are the supreme delight of the Javanese (see Color Plates V, VI, VII, and VIII). Although in every town Wild West thrillers from American motion-picture studios are enthusiastically cheered—the more exciting the better—yet it is the old wayang plays, which they know by heart and in which they can anticipate every posture, that move them with unbounded appreciation.

There is much variety in wayang performances, ranging from marionettes with movable arms, throwing shadows on a screen (see Color Plate X and illustration, page 349), to the favorite *wayang orang*, in which human actors play the rôles of mythical characters.

Like the plays in Siam and Cambodia, the wayang is a series of postures, a "slow motion picture," where each step or turn of the hand has its meaning. In the swift-moving Western World, after curiosity had been satisfied, such players would starve; yet in a pavilion in the zoölogical gardens of Soerakarta I found a troupe which in their thrice-weekly performances filled a "capacity house" and had large overflow audiences grouped outside.

One morning, through the kind help of the assistant resident magistrate and the owner of the wayang troupe, I was permitted to photograph the actors. As the grease paint softened on the face and arms of Woro Srikandi, the beautiful princess (see Color Plate XI) and her companions, and while Praboo Turondo Geni, the King of the Devils (see Color Plates V and VII), smothered behind his great curly beard in the open sunshine, I exposed color plates to my heart's content.

The most beautiful of the Javanese

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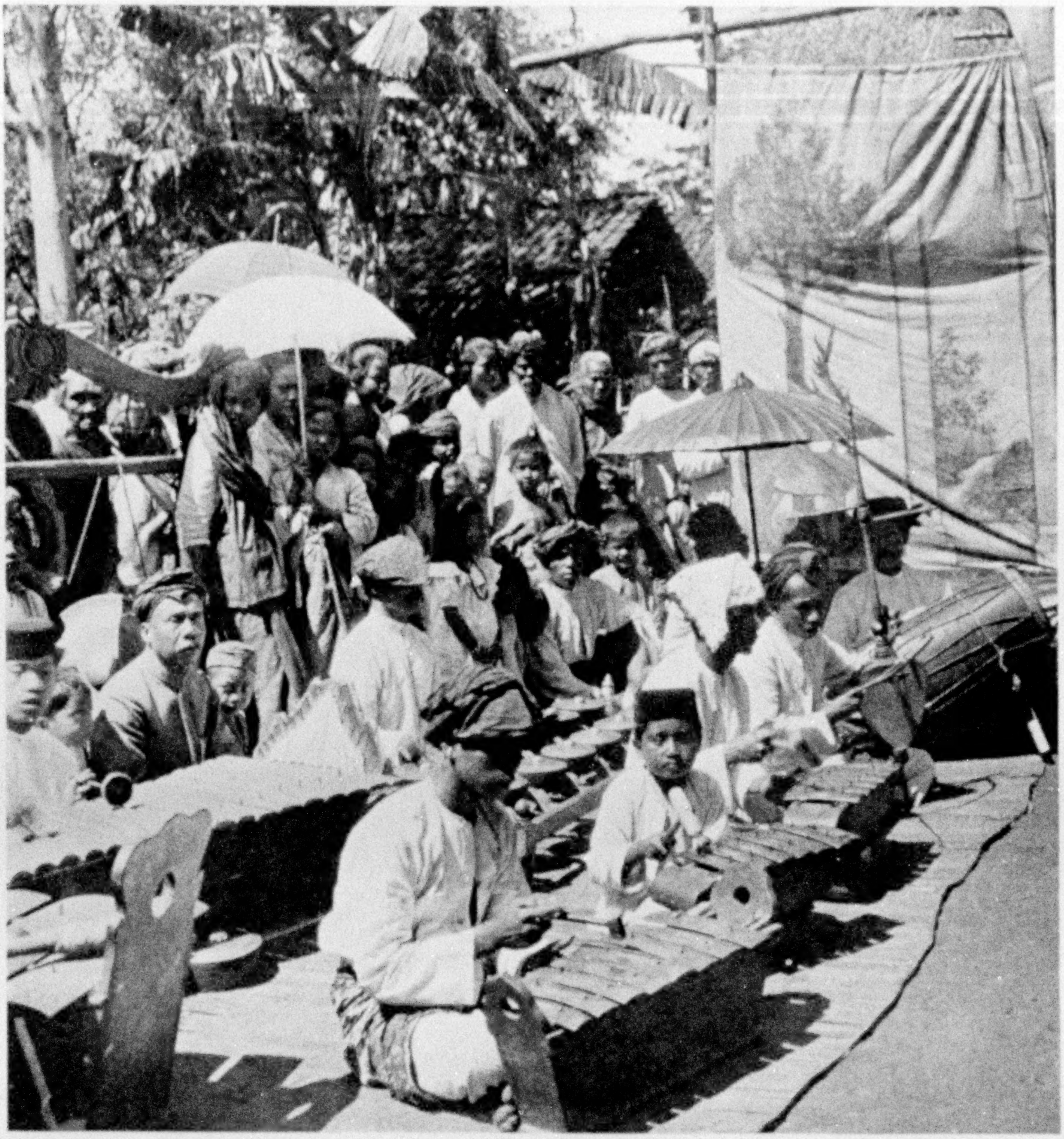
* See "Artist Adventures on the Island of Bali," by Franklin Price Knott, in the NATIONAL GEOGRAPHIC MAGAZINE for March, 1928.

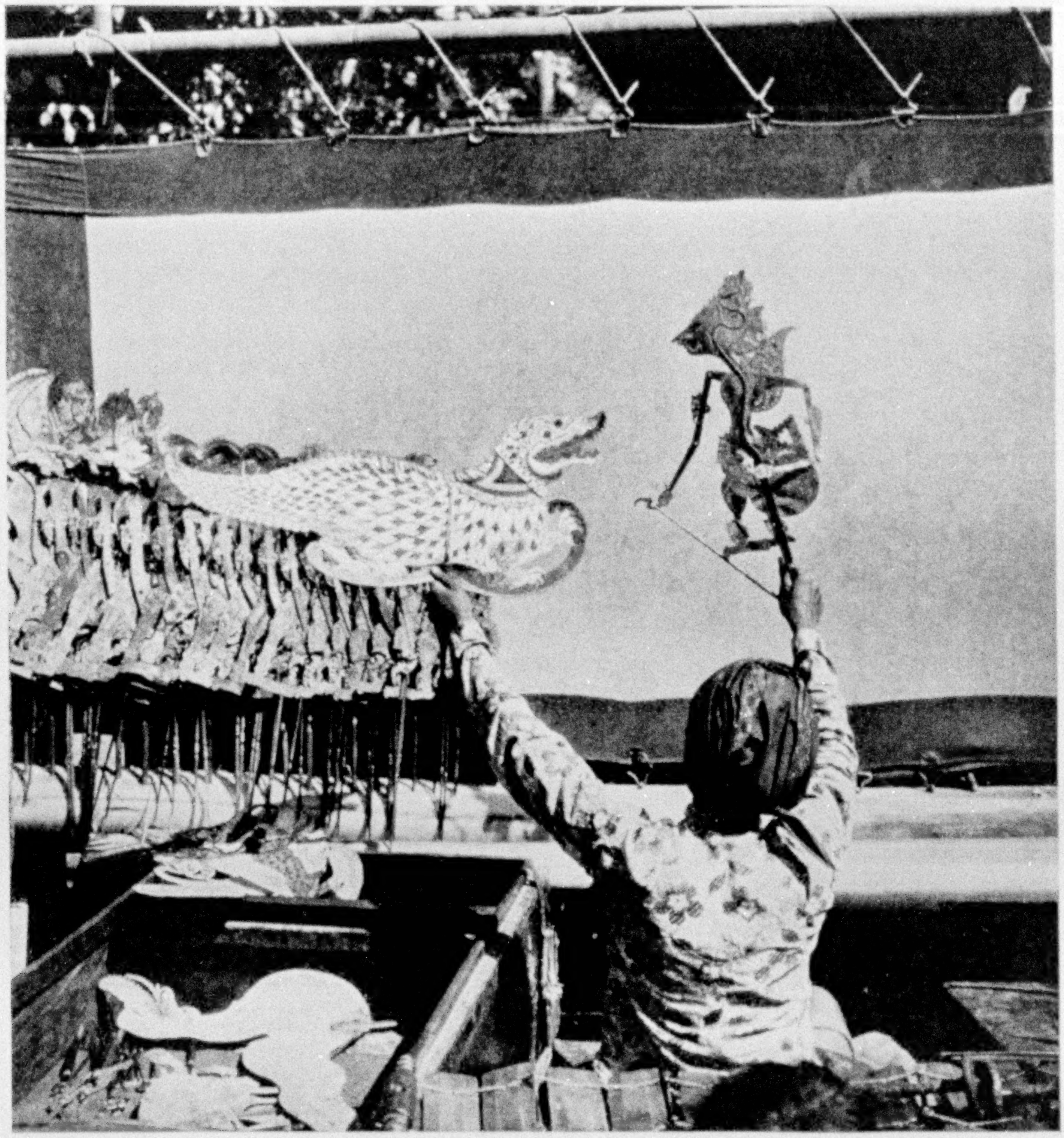


Photograph by Dr. Edward Burton MacDowell

THE GAMELAN'S MUSIC SPEAKS THE SPIRIT OF THE EAST

From 8 to 15 musicians make up a *gamelan*, or native orchestra, in which crude fiddles, gongs, bells, xylophonelike instruments, and drums are played in a minor key. At times plaintive and weird and again with great spirit and much crashing of drums and gongs, this music possesses distinctive charm.

dances are those of the *srimpi* and the *bedoyo*, which are performed only in the royal *kratons*, or compounds (see Color Plate V), at Soerakarta and Djokjakarta (Djokja), where native sultans still cling to the formality and splendor of the court life of early Java. The srimpi dance is performed on special occasions by four young girls who are usually descendants of sultans. They, together with the equally beautiful bedoyo dancers, reveal that perfection of artistry which graceful feminine movement has attained in the interpretation of ancient Javanese mythology (see, also, Color Plates VIII and X). Unfortunately, during our visit in Soerakarta, the court of His Highness the Soesoehoenan, one of the two great native princes, was in mourning over the death of one of the royal sons, so that the weekly practice of the dancers was canceled for the time being.



Photograph by Dr. Edward Burton MacDowell

HISTORY AND LEGEND PROVIDE THE THEMES FOR SHADOW SHOWS

In the oldest form of Javanese drama, living actors are dispensed with and a man who is hidden behind a screen operates various mechanical puppets or jumping jacks in front of a strong light, thus throwing their shadows on the white sheet (see, also, Color Plate X, and text, page 347).

Mingling with the crowd that streamed in and out of the kraton gateway were many members of the court, clad in short, dark jackets and long-skirted sarongs of beautiful brown batik. On their heads were perched shiny black hats shaped like small inverted buckets, and slipped under the belt in the back was the large-handled *kris,* or dagger. In mid-Java one may have the kris of his choice. Some like the sharp blades wavy, others take theirs grooved or straight; but, whatever the forging of the blade, all agree that the handle and sheath must be very ornamental.

THE BATIK FACTORY IS A SIMPLE ESTABLISHMENT

Present-day Java affects many strange combinations of foreign and native dress; but, from the Soesoehoenan to the servant, the sarong, or long, straight skirt, with a single fold in front, is almost universally worn. The better sarongs are of the native batik, but for those with small purses glaring aniline prints from Manchester take their place.

The batik industry is in itself most interesting, and in Soerakarta and Djokja, which are the centers of the trade, there are numerous small "factories." A few vats for dye, some pots of wax, and little bamboo frames on which to hang the cloth while working, together with women who have endless hours of time, and there's your factory!

The design is first sketched on the cloth with a pencil; then all of the intricate portions which are to be protected from the first dye are carefully covered on both sides of the cloth with melted wax. This is done by hand, by means of a tiny spouted cup the size of a thimble. By dyeing, removing the wax, rewaxing, and redyeing several times (usually in yellow, brown, and blue), the piece of batik is done.

Simple! Yes; but weeks, or perhaps months, of patient labor have gone into its making. Many factories now increase their output by stamping all of the wax on the cloth with brass blocks; but the quality suffers. Workers in the kratons produce beautifully designed batiks, the use of which is restricted to royalty and the court dancers.

GAMELAN MUSIC A GIFT OF THE GODS

I tried my best one morning to photograph some of the batik workers at their tasks of waxing the cloths. I had to get them to sit out in the sunshine in order to obtain the proper exposure. Several times, when I was about ready to make the exposure, the women would pick up their batik frames and flee to the shade to keep the softening wax from melting. They had no desire to spoil a month's work just to let me get a good color photograph (see, also, Color Plate XIV).

I went down in the market place to get a picture of some "hatters" cleverly folding up table-cover squares of batik into the turbans that are "Fifth Avenue" styles for the mid-Javan man (see Color Plate IX). I stayed to haggle and bargain for hours with some batik saleswomen. In Djokja and in Garoet they thronged the hotels, and repeatedly I weakened when I saw their excellent displays.

In Djokja we were allowed to make photographs in the kraton of the Sultan. On the morning of our visit some 50 men were rehearsing a wayang performance in the pavilion where the Sultan witnesses the plays and dances of the court. A gamelan orchestra toned an accompaniment to their recital, emphasizing portions with mellow gongs or softening other effects with dulcet, murmuring tones.

According to the Javanese tale, the gamelan was created by the great god Batara Goeroe when he sought to relieve the monotony of his long, uneventful life in heaven. The beauty of the music that he produced caused the gods and goddesses to perform the first joyful movements of the dance. Whatever its origin, the music is most appealing.

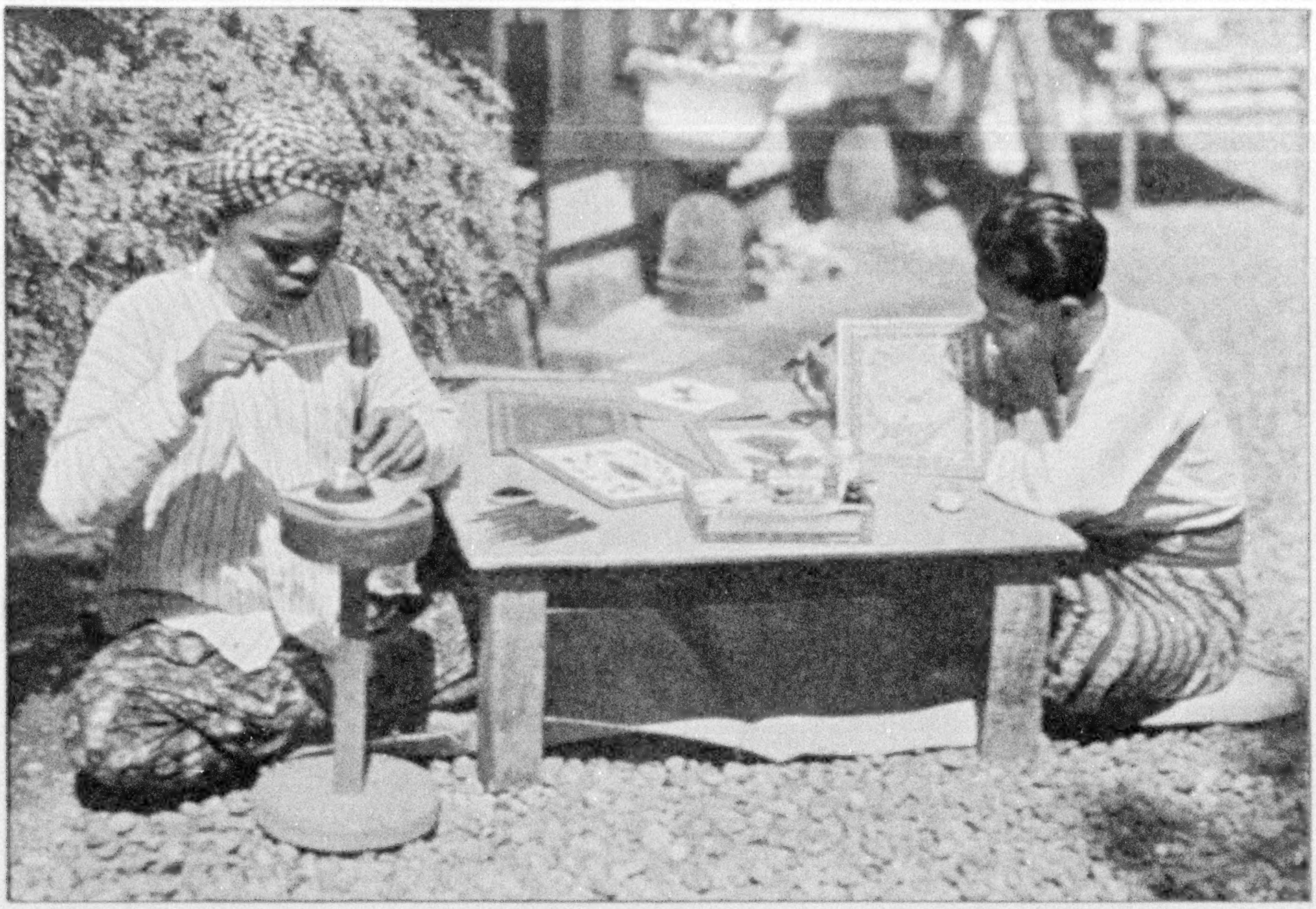
His Highness Sultan Hamangkoe Boewono VIII ordered a group of his bodyguard to appear in their full scarlet and white dress before my color lens as a gesture of friendliness toward the National Geographic Society in its effort to portray Java (see, also, Color Plates V and XI).

Almost every visitor to Djokja goes for a short trip to the ruins of Tamansarie, the old "water castle" of the Sultan who ruled in the middle of the 18th century. I followed the procession. Many of the rooms of this subterranean palace have been sadly wrecked by frequent earthquakes, which have had such far-reaching influence on the history of this island.

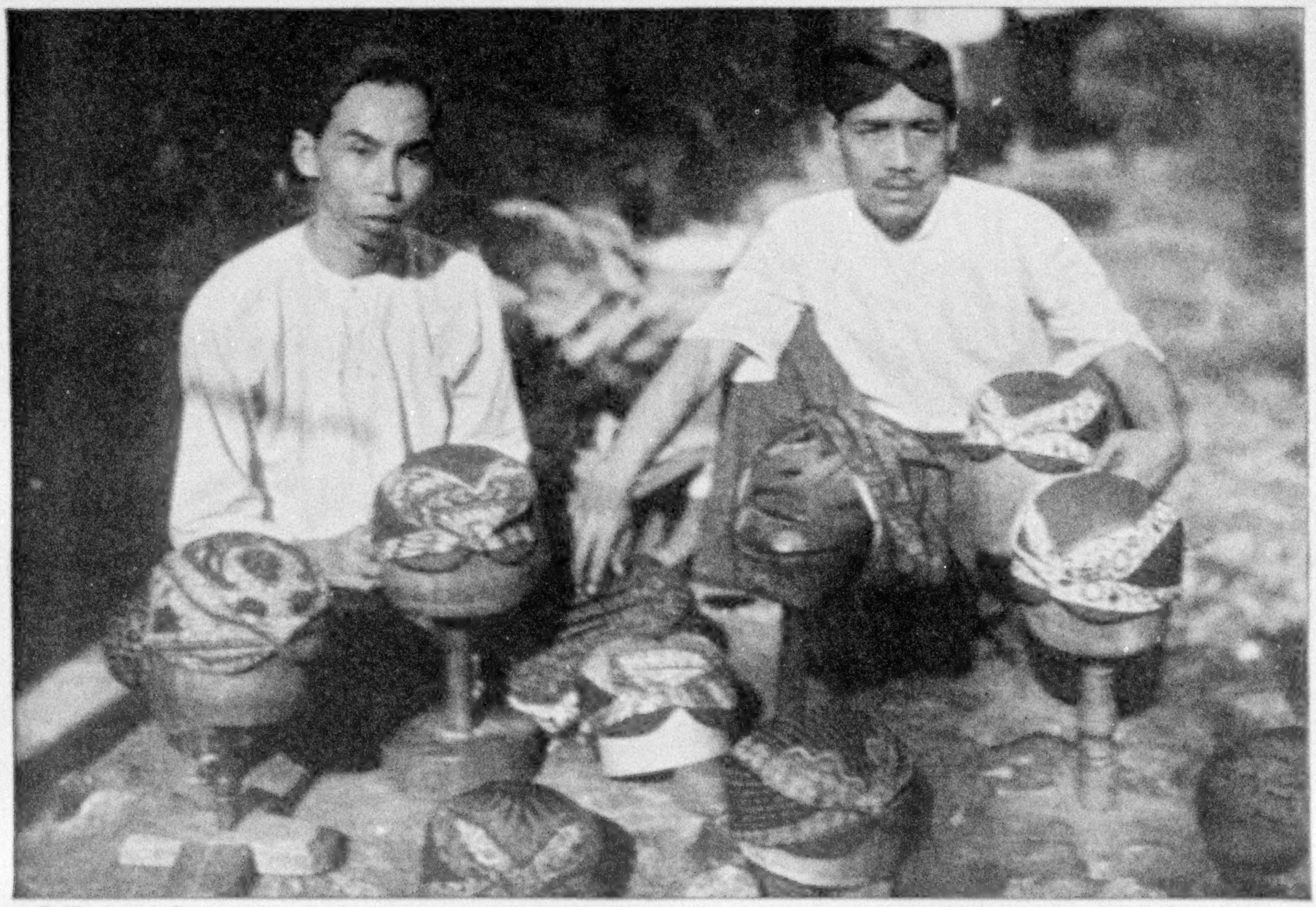
The walls of the castle are now covered with mossy-green fungi instead of tapestries; the gardens are grown up to vines and coconut trees, and in the pool which once served as the bath of the favorite princesses I found several urchins sporting about in the scum of the green water plants which covered its surface (see Color Plate IV).

All around Djokja the countryside is covered with Hindu ruins, and especially important are those of Prambanan and the famous Boroboedoer. The 26-mile motor ride out to the Boroboedoer temple was a delightful run through the cane plantations and rice fields.

Along the way we passed many two-wheeled bullock carts, with long roofs and colored sides of woven bamboo, hauling stalks of sugar cane to the mills. As we sped past one cart, which shortly before had had its fancy sides freshly redecorated,



DJOKJA IS THE CENTER OF AN INTERESTING NATIVE LEATHER INDUSTRY



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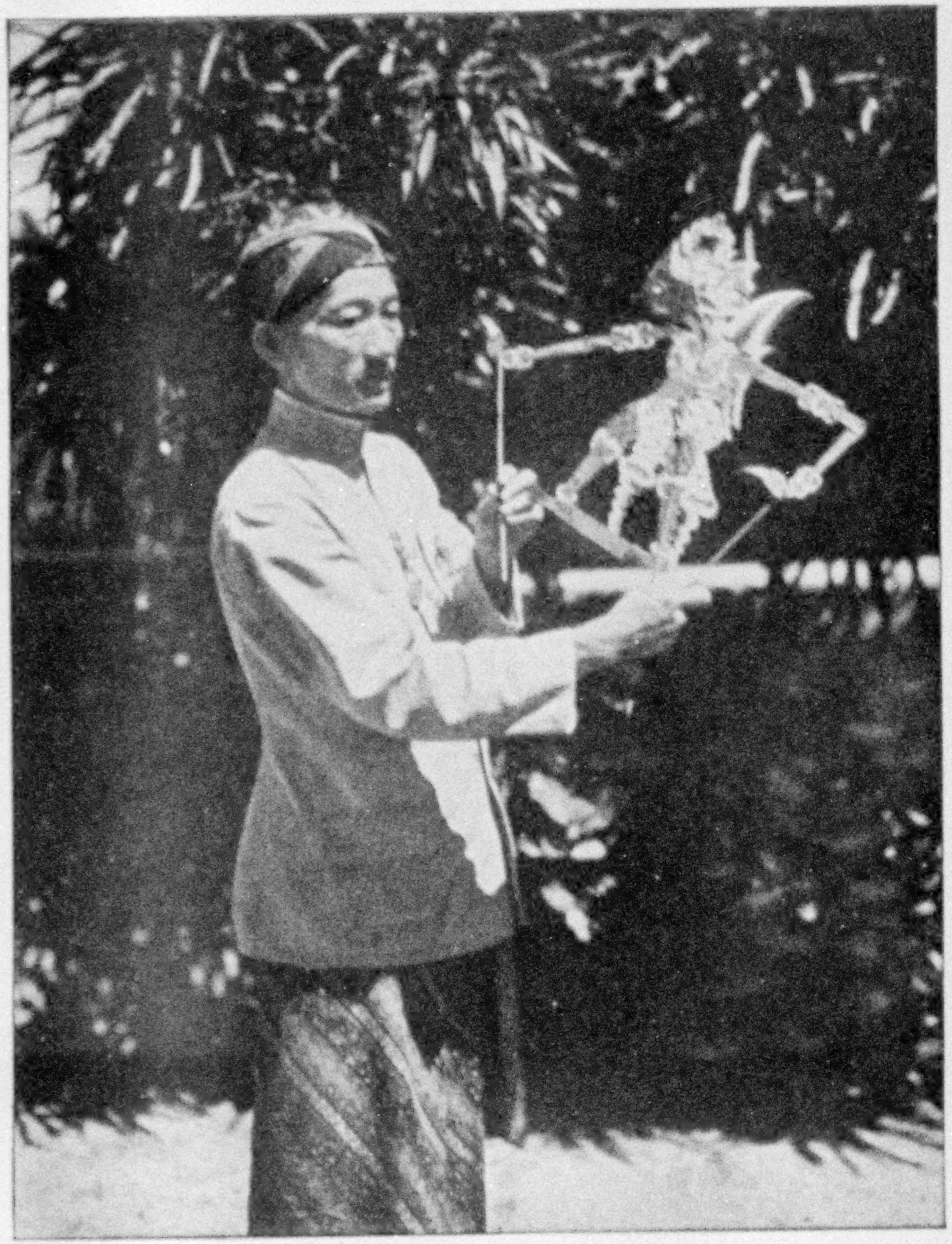
Autochromes by W. Robert Moore

BATIK CLOTHS ARE FASHIONED INTO HATS FOR THE MEN OF MIDDLE JAVA

In addition to these turban models, other strange styles are encountered. Some are like inverted flowerpots, while fezzes and a kind of sugar-loaf creation are also popular. Members of the police force sometimes wear what appears to be a section of black iron pipe.



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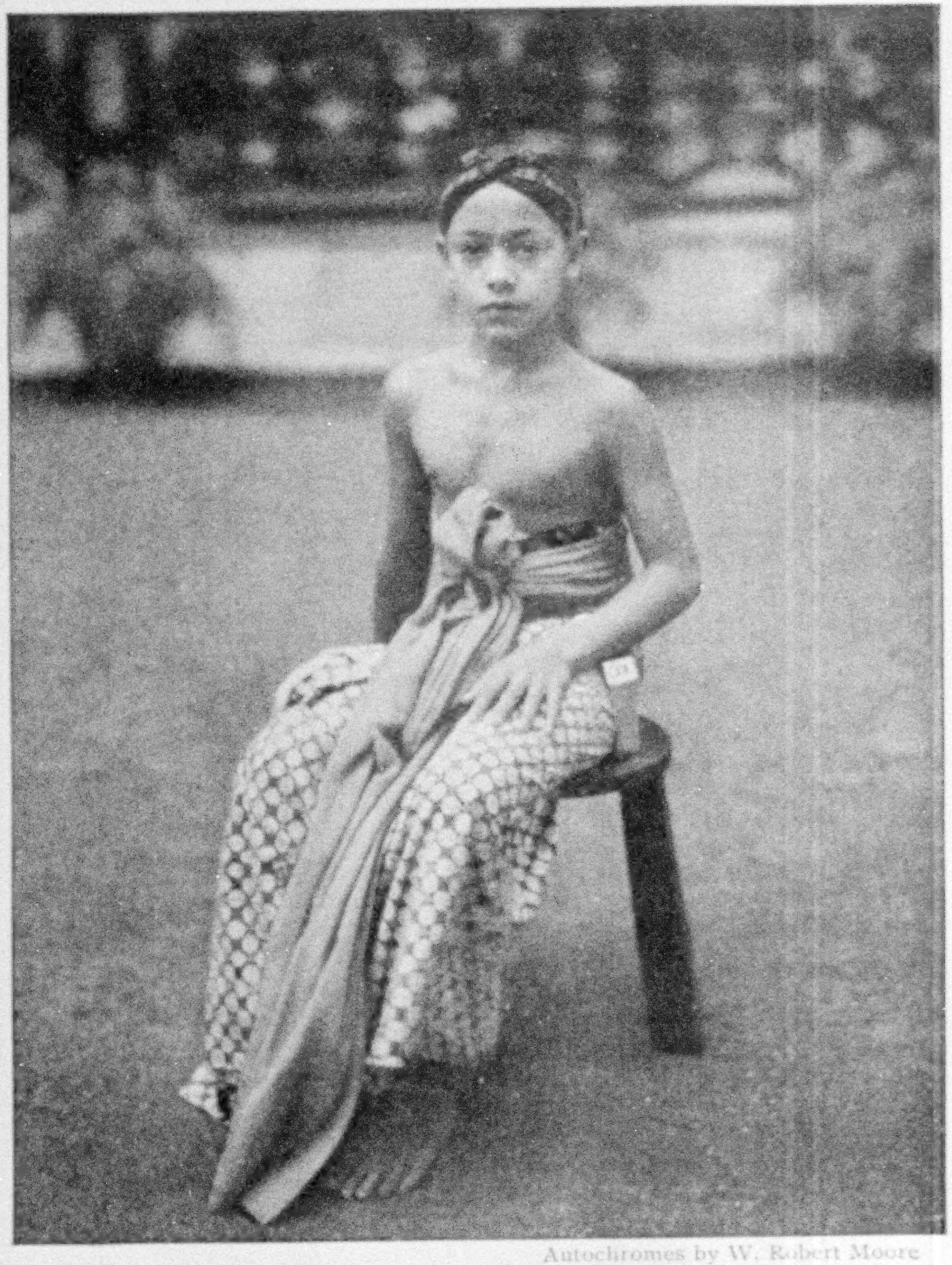
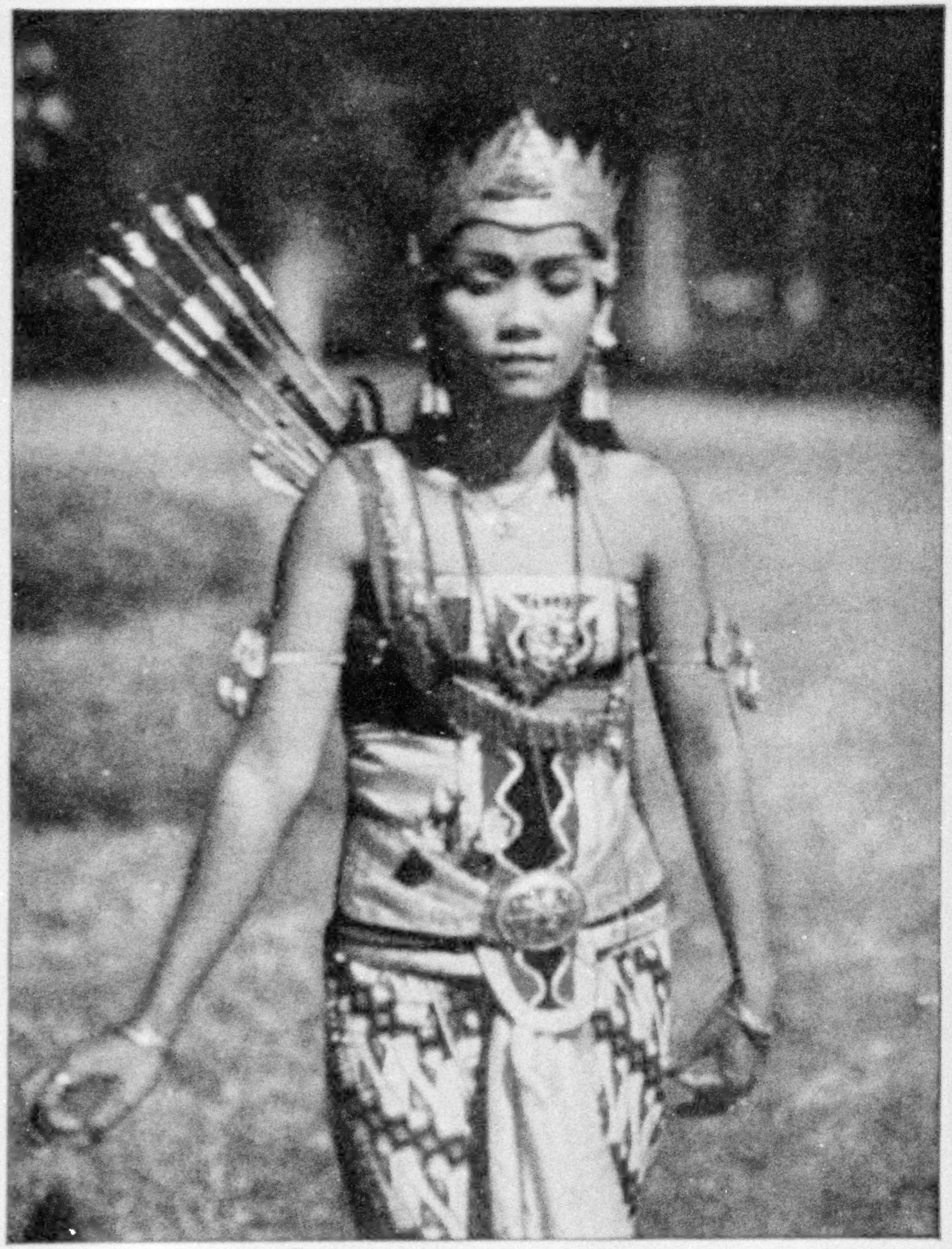
PUPPET SHOWS ARE THE FAVORITE NATIONAL PASTIME



Autochromes by W. Robert Moore

A YOUTHFUL DISCIPLE OF THE STAGE



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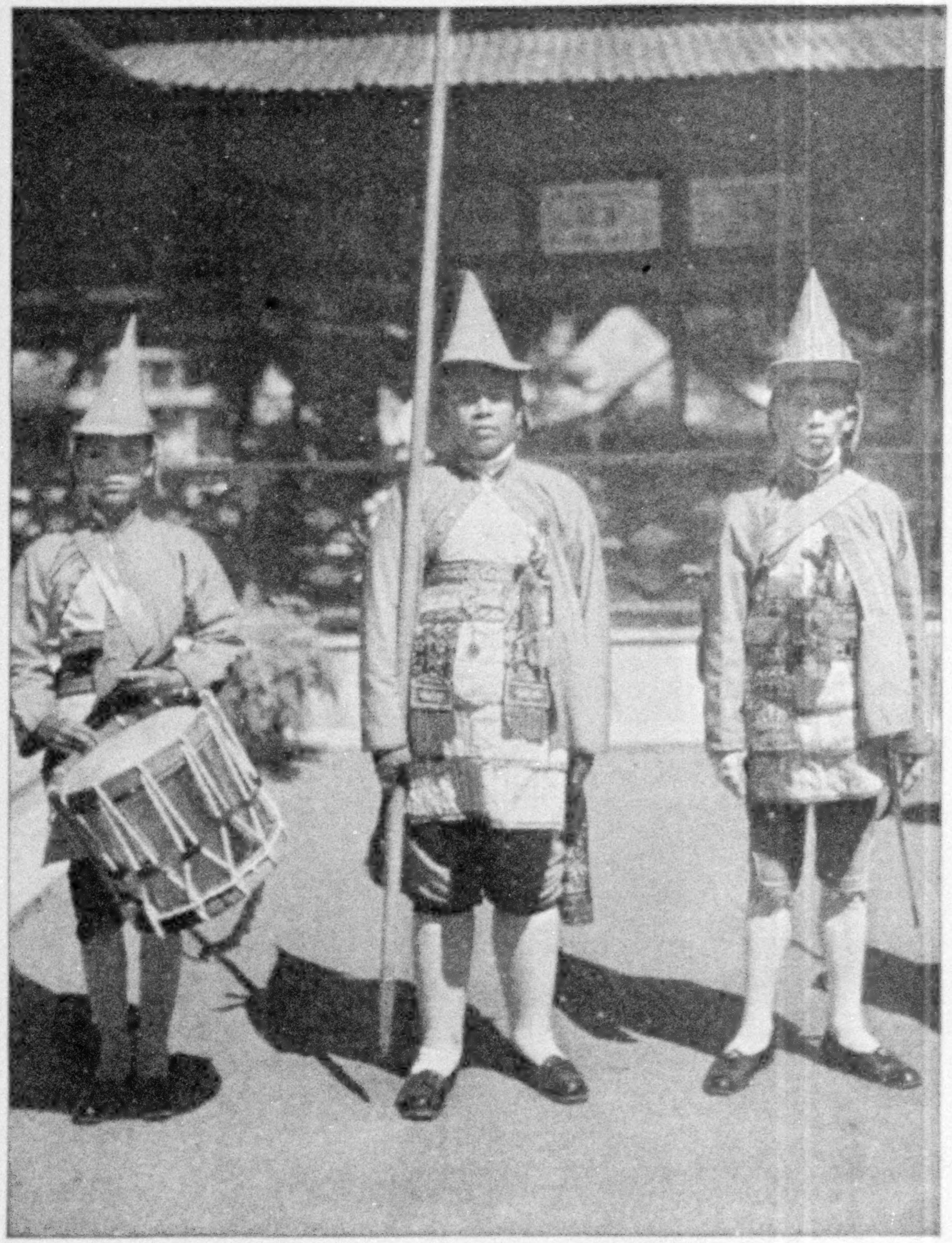
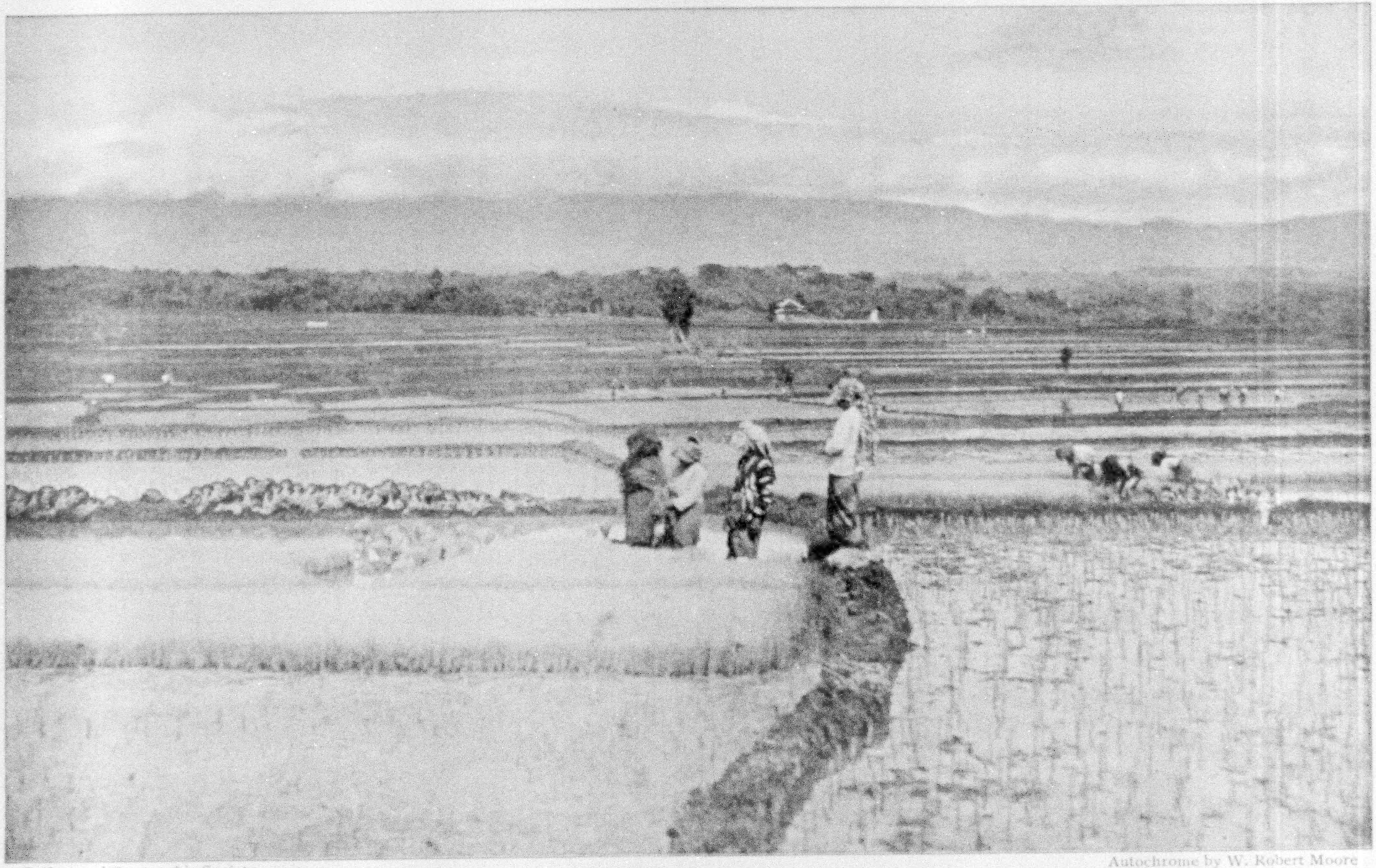
THE WAYANG PRINCESS PORTRAYS EMOTIONS BY THE POSITIONS OF HER ARMS AND HANDS



Autochromes by W. Robert Moore

NATIVE TROOPERS ATTACHED TO THE COURT OF THE SULTAN OF DJOKJA



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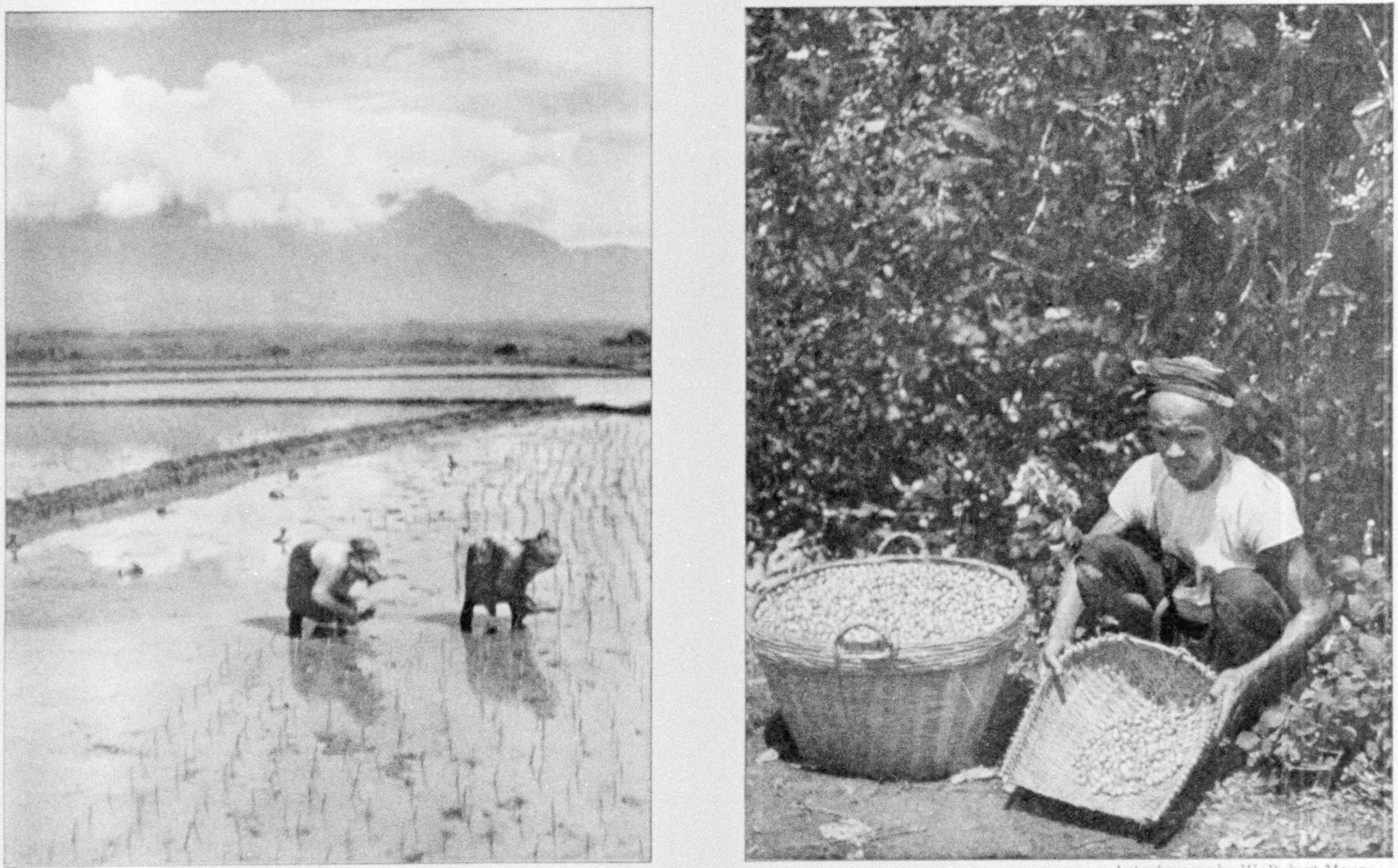
Autochrome by W. Robert Moore

THEIR TASK IS AS OLD AS THE AGES

The eternal quest for food is a vital problem for Java's teeming millions. Rice provides the solution, and the Javanese have cultivated it and relied principally upon it to sustain life for countless generations. They begrudge it no labor and flooded paddy fields are everywhere, rising like steps up the mountain sides and glittering in the tropical sunshine of the valleys.



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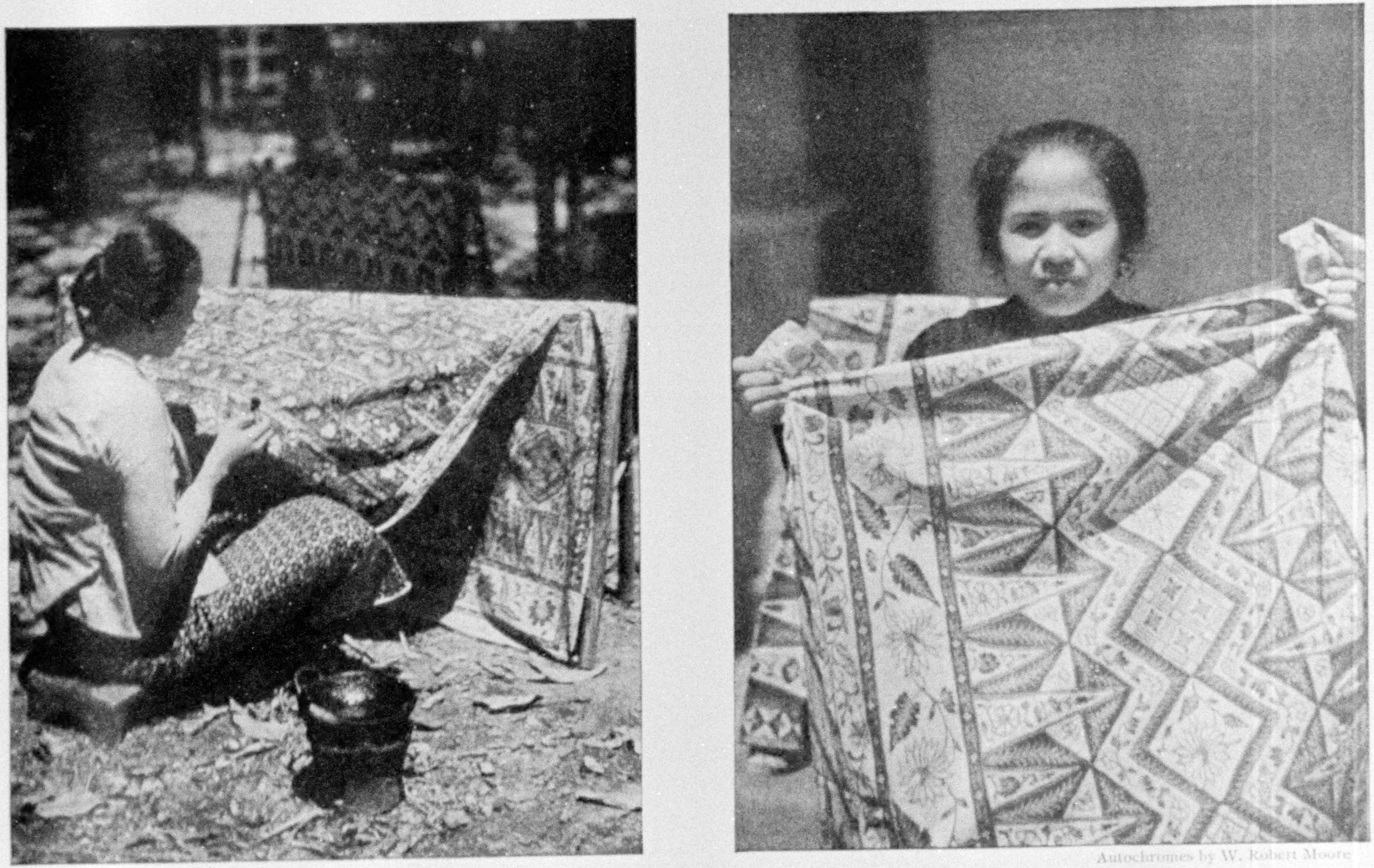
PLANTING JAVA'S PRINCIPAL CROP AND HARVESTING HER MOST FAMOUS PRODUCT

The women wading in the rice field are transplanting shoots of that staple crop. At the right a coffee picker rests with baskets of the berries that have spread the fame of Java around the world. At one time the island produced more than 100,000,000 pounds of coffee annually, but because of the ravages of a blight some of the land that was formerly devoted to growing the savory berries has now been turned to other uses.



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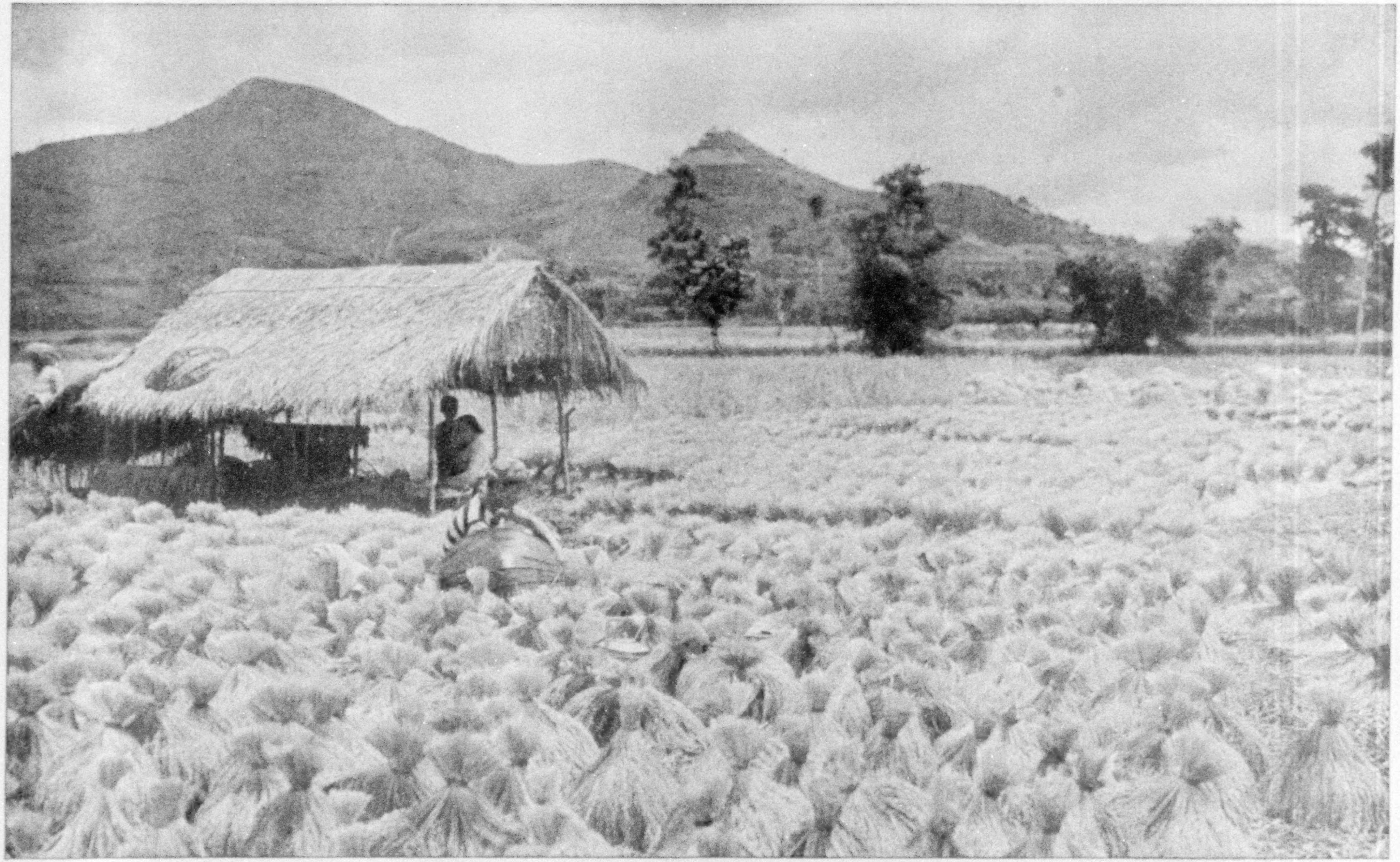
BATIKING REQUIRES A LARGE MEASURE OF SKILL, PATIENCE, AND ARTISTRY

Because of the tedious hand operations that go into its manufacture, a good batik may take several weeks to complete. This time element gives it a value which is beyond the reach of the poorer classes, and instead of using their handsome native product for sarongs and turbans, they turn to much cheaper and less attractive imported prints.



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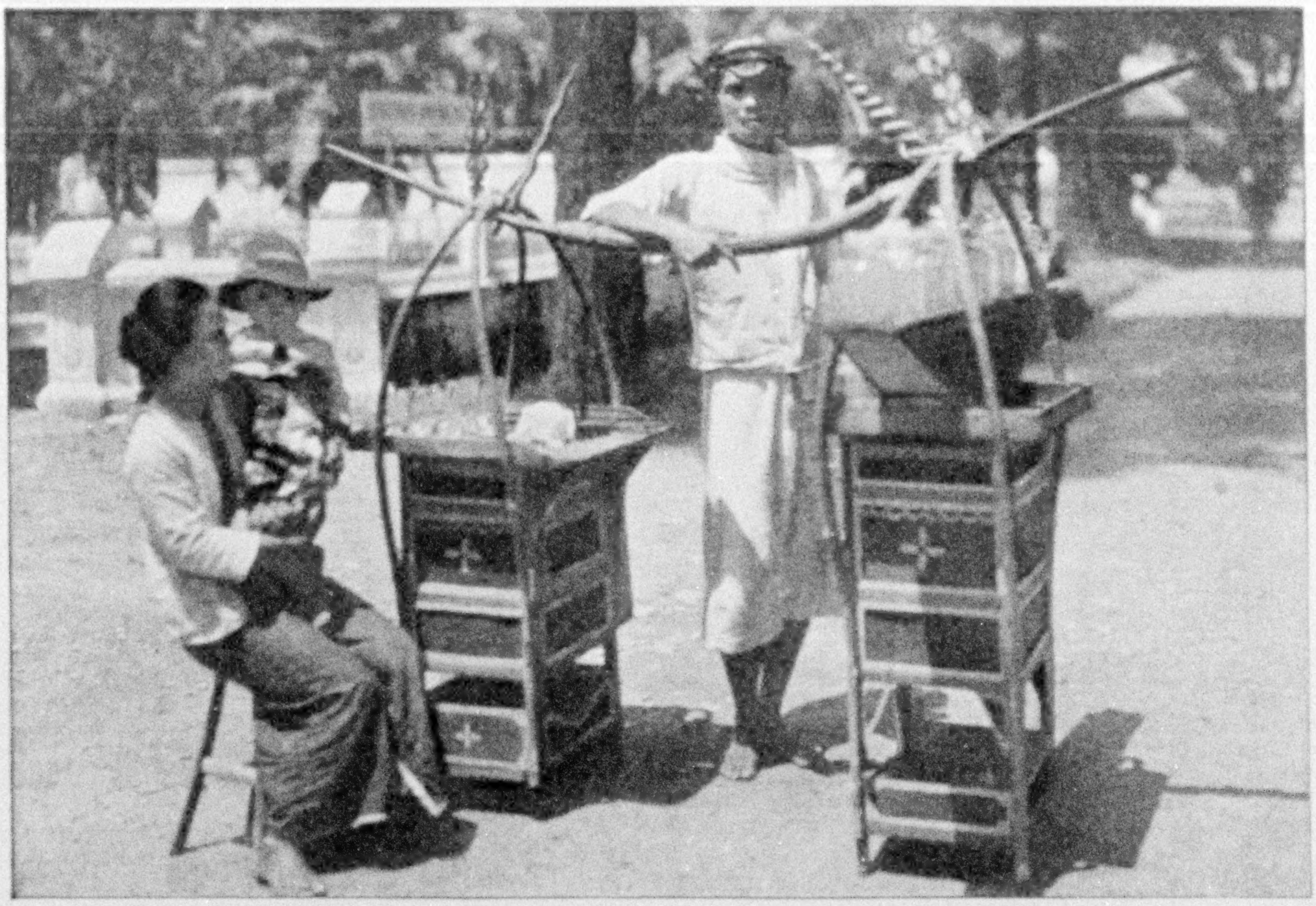
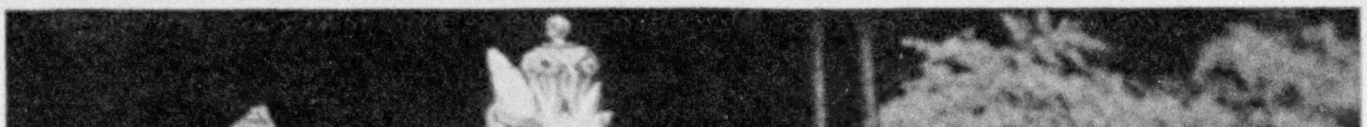
BUNDLES OF RICE HEADS BROUGHT IN TO DRY BEFORE THRESHING

Native women separate the grain from the chaff by beating it with a pestle in a wooden trough. Modern threshing machinery is practically unknown. The enormous yield of her fertile acres has earned for Java the title of "Granary of the East."



THE VENDER OF COOL DRINKS CARRIES HIS ESTABLISHMENT WITH HIM AT SOERAKARTA



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PAINTING STATUES FOR THE TOURIST TRADE

These figures are not a native product, but are imported from near-by Bali and retailed to travelers from the Western world.

I called a halt. I had to record those brilliant red, yellow, and blue pigments in their banded black and white frame. But getting the picture was a longer story.

When I asked the cart driver to stop, he spurned my suggestion and continued down the road. Gathering up the sprawling tripod legs under one arm and carrying the flying focusing cloth and plateholders in my other hand, I hurried after him, pleading *"Portret, portret,"* at every bound.

I like to think that it was his final comprehension of what I wanted, rather than the softening of his heart to humor someone who seemed mentally unbalanced, that finally led him to stop his two white bullocks to let me expose my plates! But, whatever the debate in his mind regarding my sanity, I got the picture (see Color Plate III) and we whirled on to Boroboedoer.

JAVA'S FAMOUS TEMPLE CROWNS A RICE-ENCIRCLED HILL

"It looks like a fancy wedding cake," said my companion, as the dagoba-topped ruins swung into view through the palm trees. "But really, you know, the Boroboedoer would go in Angkor Vat's waistcoat pocket," he later added, as he compared this monument with that old Cambodian temple.* Boroboedoer, which was constructed about A. D. 850, is more weathered than Angkor, as it antedates the Khmer ruin by three centuries; but it was never as pretentious in its construction or as delicately elaborate in its chiseled decoration.

The appealing feature of massive Boroboedoer is its situation. It crowns a small hill which rises alone out of palm-fringed rice fields, though not far distant from the slumbering volcano of Merapi. Angkor loses in impressiveness because it is built on a level plain. Many visitors have written about the Boroboedoer† and its moods, and I would but add my own appreciation for the efforts of those long-gone hewers of stone and my admiration for the creative sponsors of its building (see, also, Color Plate I).

From Djokja we hurried westward through the low, flat country near the southern coast, which is the most unhealthy region of Java.

Later the train climbed among beautiful mountains, but the view was unhappily soon blotted out by a heavy rain. On a branch line we spiraled around through the hills and rice terraces and dropped down to Garoet, still at the stimulating altitude of 2,335 feet above sea level.

"If you are fond of volcanoes, go to Garoet," advises a guidebook, "for active and dormant cones tower on every hand." And if you want to see the terraced rice fields at their best and beautiful Javanese girls, you'll also find them in Garoet.

We spent hours on the steep terraces outside the city, photographing the people as they raked the water-flooded fields in preparation for planting, and as they repaired the breaks in the narrow dikes where the water was cascading down into rice plots below.

In other fields the farmers were removing the rice seedlings from the nursery beds, and dozens of men and women were standing nearly knee-deep in the mud and water, busily transplanting the young green shoots into the narrow fields. In a nearby district we found numerous harvesters—more than 100 in one group—clipping off the ripened heads of rice stem by stem. Every stage of rice cultivation can be seen simultaneously in Java (see Color Plates III, XII, XIII, and XV).

The great mountain terraces and the famous wide-stretching plain of Leles, together with other rice lands in the fertile Preanger Regencies, have given Java the pseudonym "Granary of the East," yet every year she is forced to import large quantities of rice for her own consumption.

BATIK SALESGIRLS PROVE DISASTROUSLY CAMERA-SHY

Batik salesgirls, it seems, keep themselves well informed regarding new arrivals at the Garoet hotels, for by breakfast time the morning after our arrival several had already gathered around our veranda. All were attractive, some were

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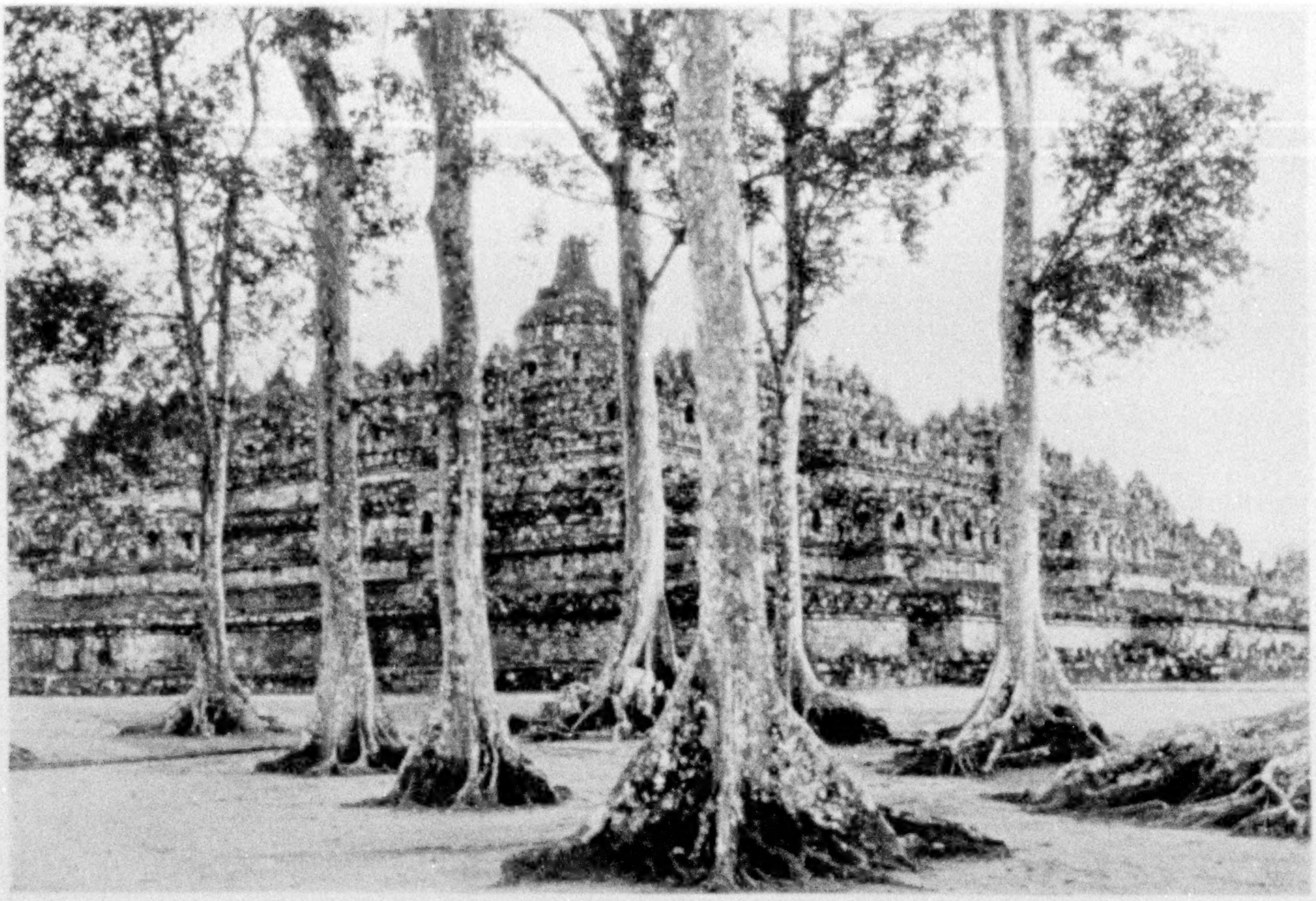
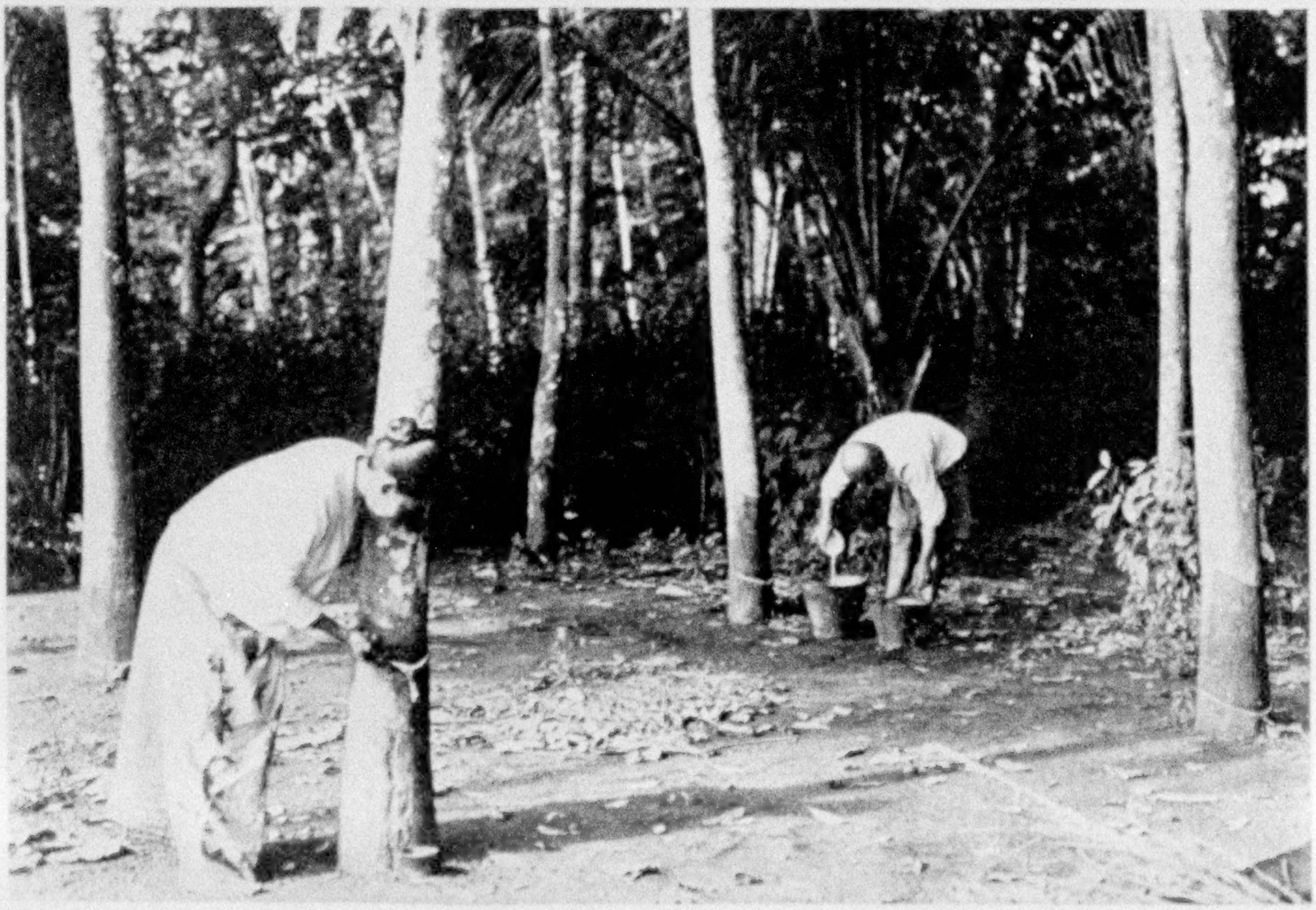
* See "The Enigma of Cambodia," a natural-color series of photographs by Gervais Courtellemont, in the NATIONAL GEOGRAPHIC MAGAZINE for September, 1928; also, in the same issue, "Four Faces of Siva," by Robert J. Casey.

† See, also, "A Traveler's Notes on Java," by Henry G. Bryant, in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1910.



WHERE JAVANESE ART REACHES ITS HIGHEST PINNACLE

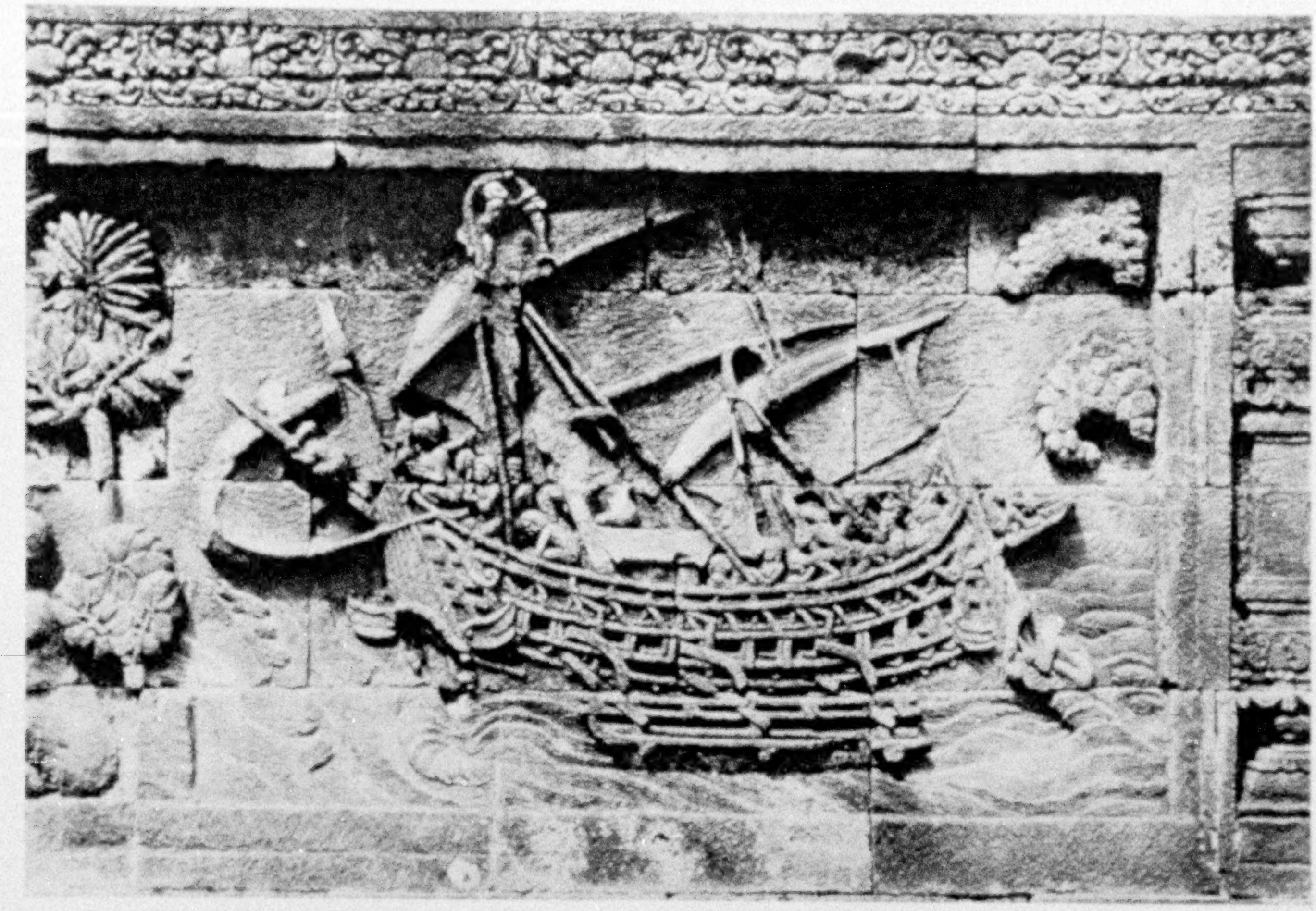
Boroboedoer was probably built as a reliquary to house some fractional portion of the Great Buddha's remains. Its skillfully conceived and executed galleries and terraces are unsurpassed in the field of Buddhist art (see, also, Color Plate I).



Photographs by W. Robert Moore

MUCH OF THE WORLD'S RUBBER COMES FROM THE EAST INDIES

When a rubber tree comes to bearing age, a tapper shaves off small areas of bark with a knife especially designed for this purpose. The latex flows from these wounds into small cups.



Photograph by Karl W. Scheufler

EXQUISITE CARVINGS ADORN BOROBOEDOER

A remarkable feature of the hundreds of bas-reliefs which embellish this magnificent structure (see opposite page) is that they are made up, for the most part, of numbers of comparatively small stone blocks, carved separately and set together like a picture puzzle.

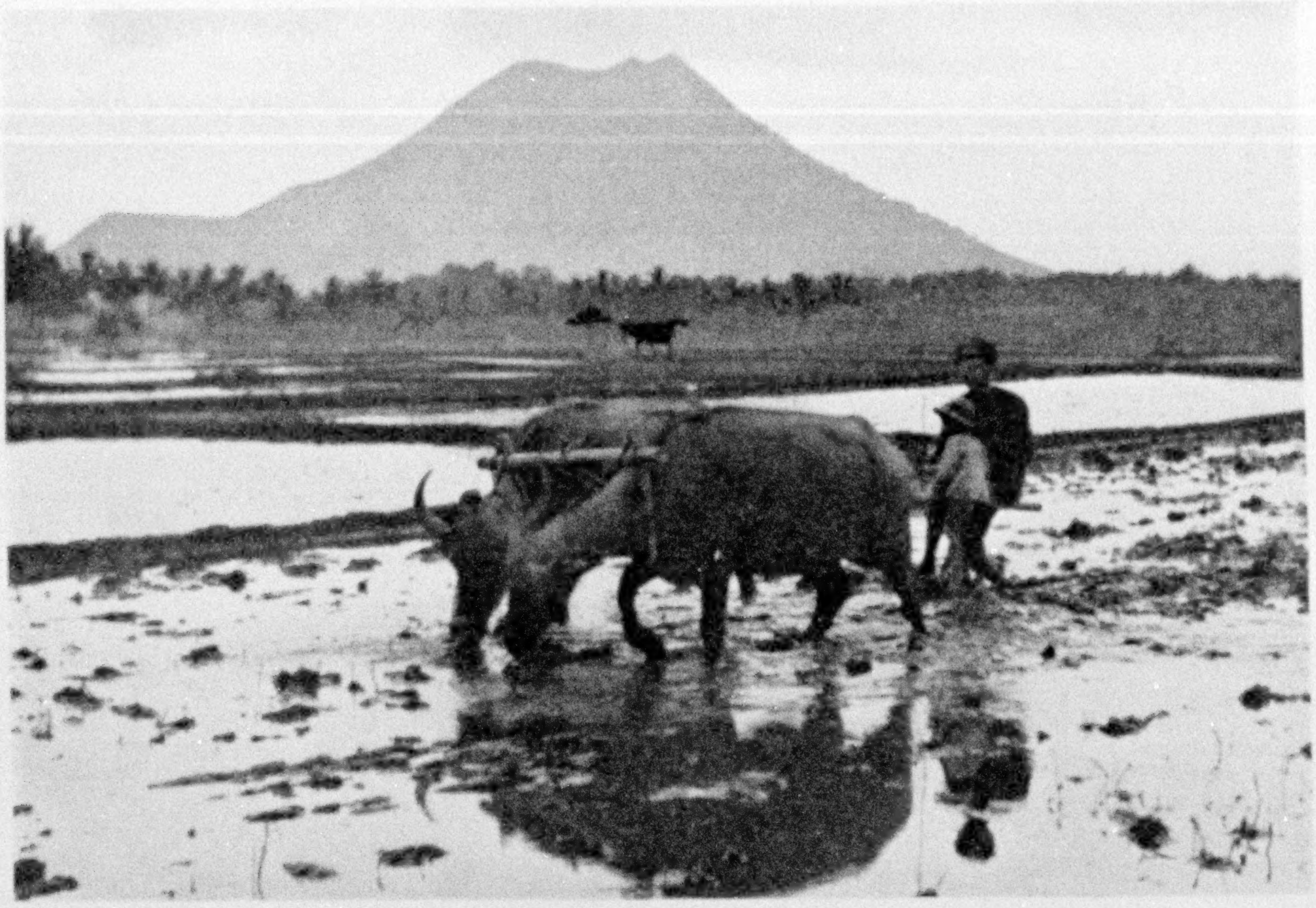
beautiful, and each carried herself with queenly grace and poise. Long hours they pleaded with us to purchase their locally made batiks (many of them with Soerakarta stamps). I promised to buy if they would pose before my camera. At last one of them consented. When I developed the color plate that night she looked like a two-headed Janus, so much had she moved during the long exposure. When she returned the next morning I showed her the failure, tried to stir her pride, and offered to boost her sales for the day, hoping thus to induce her to pose again. But she turned me down with "Verree goot," and went to hunt up some other might-be purchaser.

Other pretty maidens, bold in making batik sales, but disastrously shy before the camera, caused me to leave Garoet almost in tears, bearing quantities of batik, but my exposed color plates hopeless failures all! I shall never forgive those Preanger queens.

Had anyone told me before I visited Garoet that there is music in bamboo I should have smiled at the attempt at humor. I was heartily surprised one afternoon when several youngsters appeared at my door and began playing on some bamboo instruments and dancing for my benefit. What? The famous *angklong* of the Preanger? There they were, just hollow bamboo tubes of different lengths, held in frames of bamboo which when shaken sounded the pipes.

The music produced by those youthful musicians was truly delightful. We fell so much in love with it that my companion bought all the instruments for a guilder (40 cents) or so. In a little while the boys were back with a new set, and as long as we stayed there they came several times a day to entertain us, hoping for more pennies.

Just off from the motor road between Garoet and Bandoeng are the fish ponds of Tjipanas. Such a delightful spot it is! At every turn a new vista met our eyes—sweeping coconut palms, tall, slender betel-nut trees, small bamboo houses, flowering green hedges, fishermen, all



Photograph by W. Robert Moore

MOUNTAIN, FOREST, AND FLOODED FIELD REFLECT THE CHARM OF JAVA

Water buffalo plod patiently through the muck of the rice fields, lending their tremendous strength to the production of food for the island's teeming millions.

doubled in the reflection cast on the mirror surfaces of the pools. Never before had I seen such a fascinating combination. We spent happy moments seeking yet new vantage points of the mirrored waters.

The ponds are used for cultivation of fish for market. Some are filled with salt water and others fresh, so that both kinds of fish may be raised. Among the most beautiful of the fish is the large goldfish, a species of carp, usually 12 or 18 inches in length when marketed (see Plate IV).

Much of the hill district in the Preanger Regencies is devoted to tea and cinchona plantations. The cinchona groves of Java, which have been developed from a few imported South American trees, now produce nine-tenths of the world's supply of quinine. Behind barricaded walls in a factory at Bandoeng, quantities of the invaluable malaria specific are produced, and the Dutch are protecting their secret formulas by garnishing the walls with barbed wire, as if it were a diamond-mine compound.

At this boom city of Bandoeng the railway, air service, and many other Government and private business concerns are establishing their headquarters.

We passed on to Buitenzorg, with its world-famous botanical gardens and the palace of the Governor General of the Dutch East Indies (see Color Plate II). One could spend weeks in the gardens, visiting the Natural History and Economic museums and in seeing the Government agricultural gardens, but other lands were calling.

As we moved out of Buitenzorg toward Batavia, there was one last picture that I wish I might have recorded on a color plate. The late afternoon sun's rays were touching the quiescent volcanic pyramid of Mount Salak (see Color Plate II). A group of slender, laughing maidens in flashing sarongs were filing homeward along the gleaming fields of tender rice; and an aged farmer, guiding an ancient plow, was urging two lazy water buffalo through the oozing mud in a near-by field—thus flashed the final picture before our eyes, epitomizing Java.

A VACATION IN HOLLAND

By George Alden Sanford

Author of "A Vacation in a Fifteenth-Century English Manor House," in the National Geographic Magazine

ONE who has a bird in his heart, they say, can see a flock in every bush. The same law holds true for one who has a vacation in his heart, who looks forward to seeing interesting places and things of the world; he is keen to see and recognize the possibilities of a "prospect."

It was Jan, our moon-faced Holland cook, who was always telling us about people and things in the Low Countries, who was responsible for this vacation. He interested us so much that in due time we leased for the summer, at approximately $100 a week, silver and linen included, the furnished Zee Droom Cottage, on the North Sea, where Jan had once served the family of a Rotterdam lawyer. Thus our dream of a vacation in the Netherlands was to come true.

After a preliminary swing through France, Switzerland, and Belgium, we bumped over the imaginary line which separates Belgium from the Netherlands and found ourselves in a new environment.

Rosendaal (Rose Valley), on the border, where baggage is examined, with its clean and tidy buildings and bright setting of roses, gave a hint of what we were to see in the land of our summer adoption. The ugly, prosperous smoke of Belgian factory towns gave place to peaceful meadows, where black and white Holstein cattle grazed contentedly and where an occasional windmill flirted us a welcome with its whirling arms.

ROTTERDAM, FIRST PORT OF CALL

Rotterdam was our first "port of call," but Rotterdam is a big commercial city and not nearly as "Hollandesque" as the smaller towns and villages, where old customs and costumes survive. It is well gridironed with canals. Sloops, barks, and boats of various types carry flowers, vegetables, cheese, freight, and passengers hither and yon; some are propelled by man power, some by horse, and others by wind and motor. There is little danger of nervous prostration from boat travel in Holland, but it is good fun.

We saw the Boompjes, which we judged, by the name, would at least be a fort, but beheld a street lined with little bushy trees. In Dutch, *boom* means "tree," and the final syllable *je* or *jes* is the diminutive "little," or is a term of endearment; so Boompjes means "little trees."

After a night in Rotterdam, we took train for Amsterdam; thence on to Alkmaar, in North Holland, where we transferred to a double-deck steam tramcar, which bumped its way along through hamlets and fields glorious with heather.

A SOCIABLE TRAM CONDUCTOR

These steam trams serve the small and outlying communities and are a great institution. The conductor became our friend, and when collecting our fares gave us a military salute and addressed me as Mr. America. He would linger for crumbs of information about the United States. He asked if we knew his cousin who lived in South Dakota. After an eight-mile ride the train deposited us at our summer home town, Bergen, on the North Sea.

If you have never been, even for a short time, a quasi-citizen of a strange country, you have interesting experiences coming to you. Tourists who tear through a country by motor car or on express trains miss many of the interesting sights and especially contact with the people. I agree with Mrs. Murphy, a protégée of Bishop Potter. In order that she might know the charms of the country, he transferred her there. In a few days, however, he met her back in the congested city. "Why, Mrs. Murphy," said he, "what are you doing here?" "Oh, Bishop," she replied, "people is better than trees." Which may be said of Hollanders. They come from a wonderful ancestry, the Batavians, who were great warriors and equally great in patient industry.

Nearly one-half of the country being below sea level, constant vigilance in watching the dikes is necessary;* otherwise it

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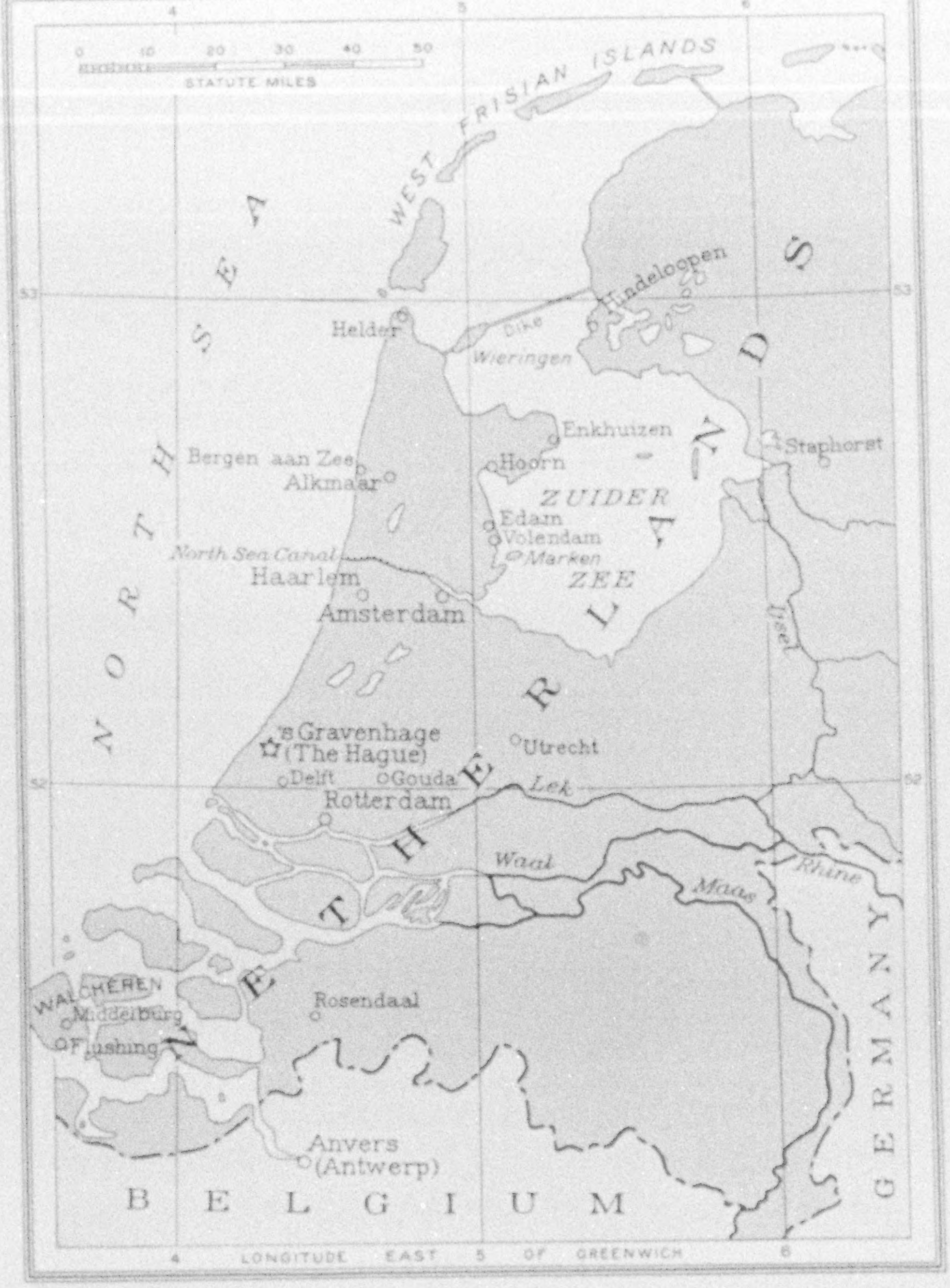
* See, also, "Holland's War with the Sea," by James Howard Gore, in the National Geographic Magazine for March, 1923.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STATUTE MILES
WEST FRISIAN ISLANDS
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Helder
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Bergen aan Zee
Alkmaar
Hoorn
ZUIDER ZEE
Edam
Volendam
Marken
North Sea Canal
Haarlem
Amsterdam
IJsel
's Gravenhage (The Hague)
Utrecht
Delft
Gouda
Lek
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Waal
Rhine
Maas
WALCHEREN
Middelburg
Flushing
Rosendaal
Anvers (Antwerp)
BELGIUM
GERMANY
4
5
6
53
52
LONGITUDE EAST 5 OF GREENWICH

Drawn by A. H. Bumstead

A SKETCH MAP OF HOLLAND

On a land area about equal to the combined land areas of Maryland and Delaware, Holland supports a population of more than 600 to the square mile. The Nation's rich colonial possessions include vast holdings in the East Indies (Java and Sumatra, Celebes, Bali, and parts of Borneo, New Guinea and Timor), and Dutch Guiana and the Dutch West Indies in the Western Hemisphere.

would be back under the sea, from whence it came. There is a current saying in Holland that God made the sea, but man made the land. Now, Dutch engineers are reclaiming the Zuider Zee (the South Sea), which covers more than 2,000 square miles.

ZEE DROOM COTTAGE, A SUMMER HOME

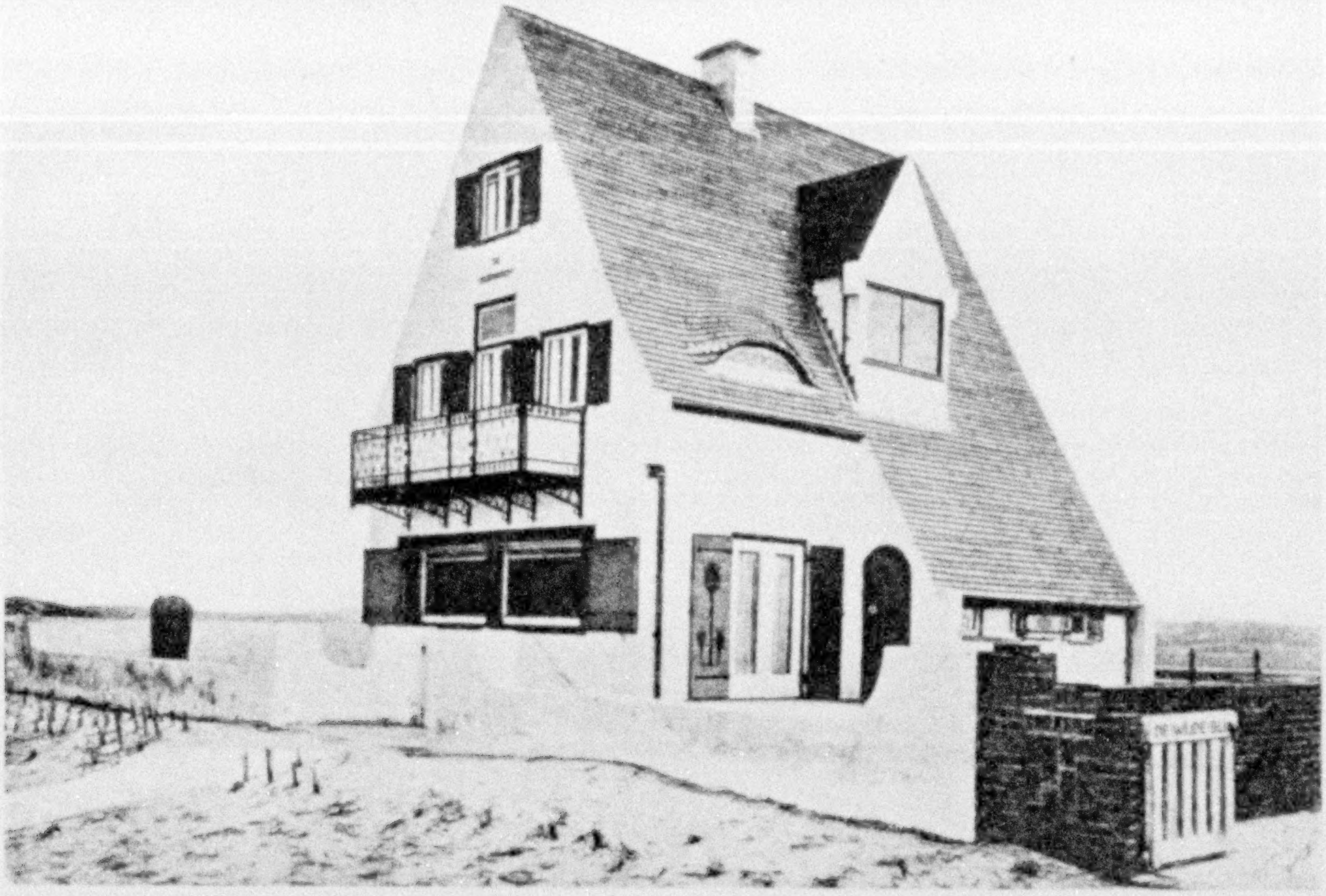
We have wandered far afield from the Sea Dream Cottage, our summer home. Let us come back to it. The house is built of brick and tile, on the sand dunes, about 100 feet above sea level, and the idea of a sea dream was carried out in every particular. The iron balcony in front of the second story was a veritable "crow's nest" (see illustrations, pages 365 and 376). From it we could see a stranded British warship, the *Camperdown*, which was beached in a fog during the World War.

The beds were built in like berths, only more spacious. We had electric lights and grate fires. From the living room large plate-glass windows gave us a wide seascape. To protect the windows from high winds, which blow especially hard at night, heavy wooden shutters were provided.

These shutters also gave an opportunity for the owner, like other house owners in Holland, to take a fling at art. The type of art is usually of conventional designs in bright colors; but in the case of the Zee Droom, sea anemones, foraminifera, octopi, squid, lacy seaweeds, and other forms of sea life were the decoration motifs.

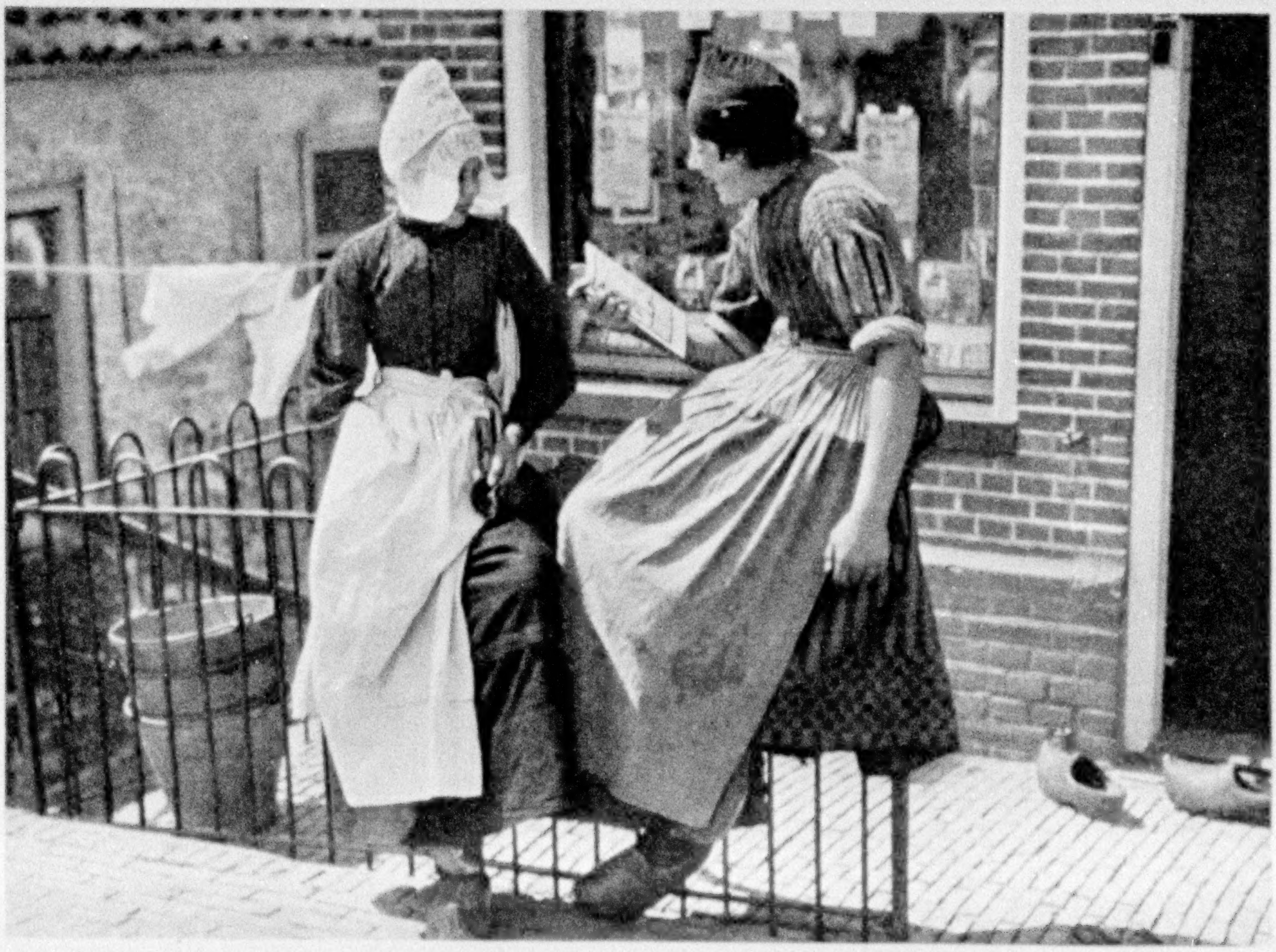
TRIALS OF CAKE-BAKING IN HOLLAND

On arrival at the Zee Droom we found our Jan in charge and everything spick-and-span. To his staff he had added his sister as housemaid and his mother as laundress. Everybody was untiring to give us a happy time in Holland. Living was much the same as at home, except that the setting for the picture was everywhere unusual. The milk boy served us from a



Photograph from George Alden Sanford

THE AUTHOR'S VACATION HOME IN THE SEASIDE VILLAGE OF BERGEN



Photograph by Melville Bell Grosvenor

DUTCH DAMSELS TALK SHOP

The fishing village of Volendam, huddled behind its bulwark of dikes, is a happy hunting ground for the artist and tourist, especially on Sundays when the fishing fleet is in from the Zuider Zee. Of course, one must always remove his wooden shoes before entering a house, even if it be but the village grocery.

milk cart drawn by a dog. Our fishman, generously broad of beam, brought us strange but delicious fish.

We had been away from home long enough to give the ladies a desire for some real American cake. They undertook to produce it, but the grocer didn't know baking powder. He sent us to the chemist, who produced a supposed substitute. The result of much discussion and experimentation was a great production, a genuine American cake, such as Mrs. Newlywed presents to her adoring husband, but which is known to the initiated as lead cake.

But we found a solace at the grocer's in East Indian chocolate, the finest member that we have known of that splendid family. It is a bitter chocolate of an indescribable but unforgettable blend.

We had a fine beach at Bergen aan Zee, wide and clean, with many *bad stoelen* (wicker chairs, with hoods to protect from the high winds) and bath wagons, where milady could don bathing garments and be drawn down to the sea by a horse.

One day in August the children had their innings; the cottagers pooled their guilders, and prizes were awarded to those whose sand forts resisted the tide longest.

The local church, Dutch Reformed, was always filled at the services. The ritual, in which all the people joined heartily, was beautiful. During the prayer by the domine, which was usually quite a long one, the men of the congregation stood.

THE BARRIER OF LANGUAGE

Some of our neighbors we came to know, but many were separated from us by the barrier of language. Of course, we could fall back on the sign language, which is but one step removed from the Stone Age, and which is by no means an exact science. Once in Spain I tried to explain to a hack driver that I wished to see the bull ring; but, as he seemed hazy as to my meaning, I sought to illustrate by putting my hands to my head to suggest the horns of a bull. "Si, Señor," he chattered, and we rattled away over the stones and brought up directly—at a dock. He thought I wanted to swim!

The Dutch language is difficult, to say the least. Some words seem related to the English, but most were incomprehensible to us. Lang Straat, Alkmaar, where we did our banking, is Long Street; but how about tooneelspeelster (actress), gemeenschappelijk (jointly), verstandsverbijstering (insanity—and the name is responsible for it), stoombootmaatschappij (steamboat company)?

LACE CURTAINS IN A CATTLE BARN

Holland is a great agricultural country, is thoroughly irrigated by canals, and has been fertilized by cattle for centuries. For beautiful black and white Holstein and Dutch belted cattle Holland takes the prize. On our way to Volendam we visited a cattle stable attached to a farmhouse. It was as spick-and-span as the *goede vrouw* could scrub it, and the windows of the stable were hung with lace curtains!

The cheese in Holland, especially Edam and Gouda, is excellent. Alkmaar is the center of the North Holland cheese trade. Friday is market day, and the visitor to Holland who misses attending it misses one of the most interesting sights there. Early in the day, trucks, carts, and boats of various types arrive, all loaded with cheese. The plaza about the attractive Weigh House (see page 377) is covered with thousands of golden cheese balls about seven inches in diameter.*

The farmer, wearing a black skullcap, is looking after his wares and for a prospective buyer. The "prospect" comes along and the farmer sallies forth. At first he is cold to the buyer's overtures, and after long bargaining scorns the offer made. Later, when the market is about to close, they get together again; the farmer plugs his wares (cuts out a small sample) for the buyer, and the sale is completed by "striking hands," which is a custom generations old. When this is done, the transaction cannot be reopened.

After the sale, porters, who look like members of a Pinafore Opera troupe, carry off the cheese in boatlike frames, and the unsold cheese goes to a factory, where it is prepared for shipping, and, lo, in due time, appears on American tables. But fresh cheese is as different as fresh fruit or vegetables. No wonder the favorite dinner dessert in Holland is "biscuits and *kaas*."

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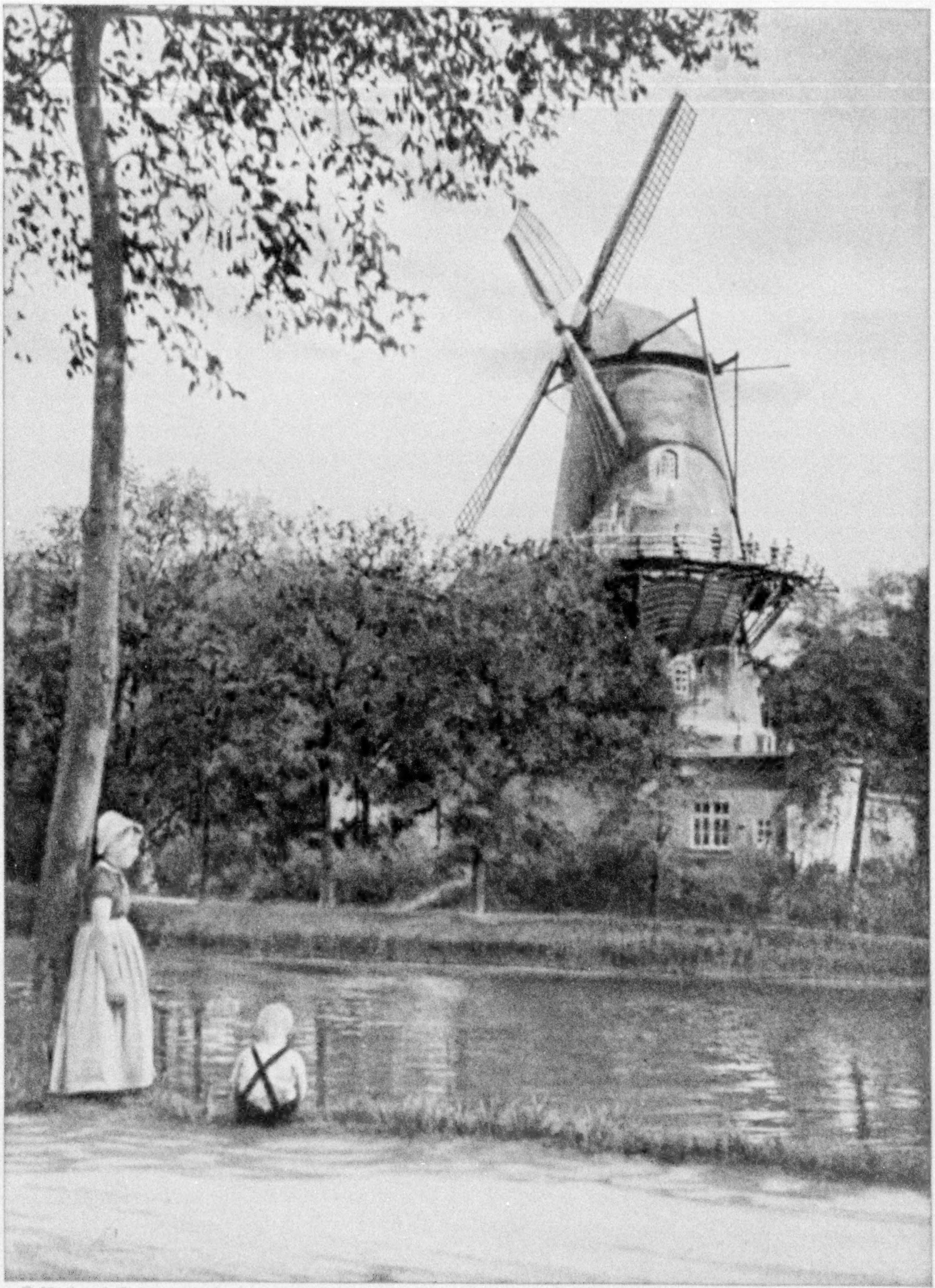
*See, also, "A North Holland Cheese Market," by Hugh M. Smith, in the NATIONAL GEOGRAPHIC MAGAZINE for December, 1910.



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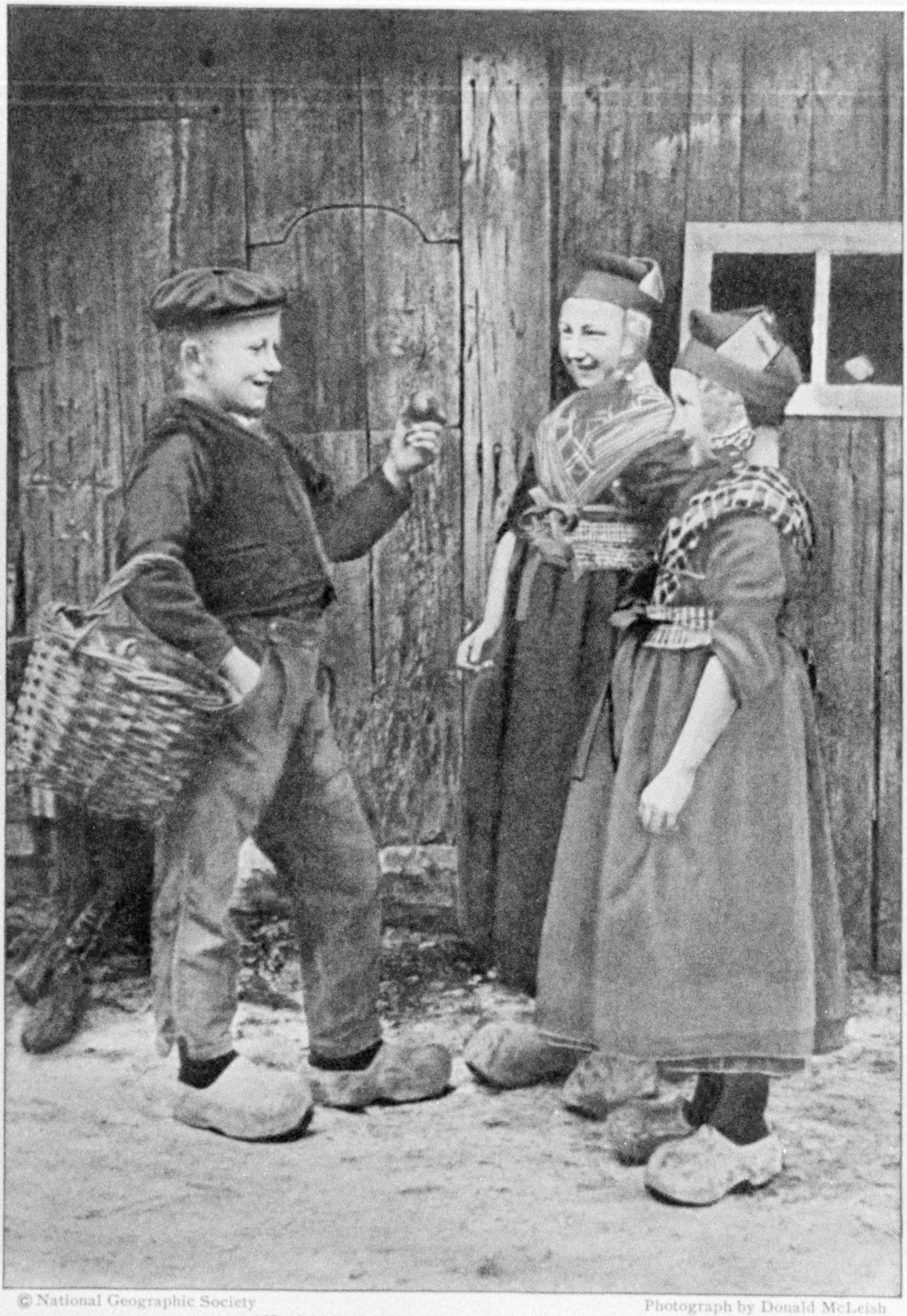
Photograph by Donald McLeish

STEAM AND ELECTRICITY THREATEN HOLLAND'S WINDMILLS WITH EXTINCTION

For centuries these monuments of a bygone industrial age have served as partners with the dikes to keep the Netherlands above the sea. There is something almost human about the old mills, and a society has now been formed for the preservation of those that have survived the ravages of time and progress.



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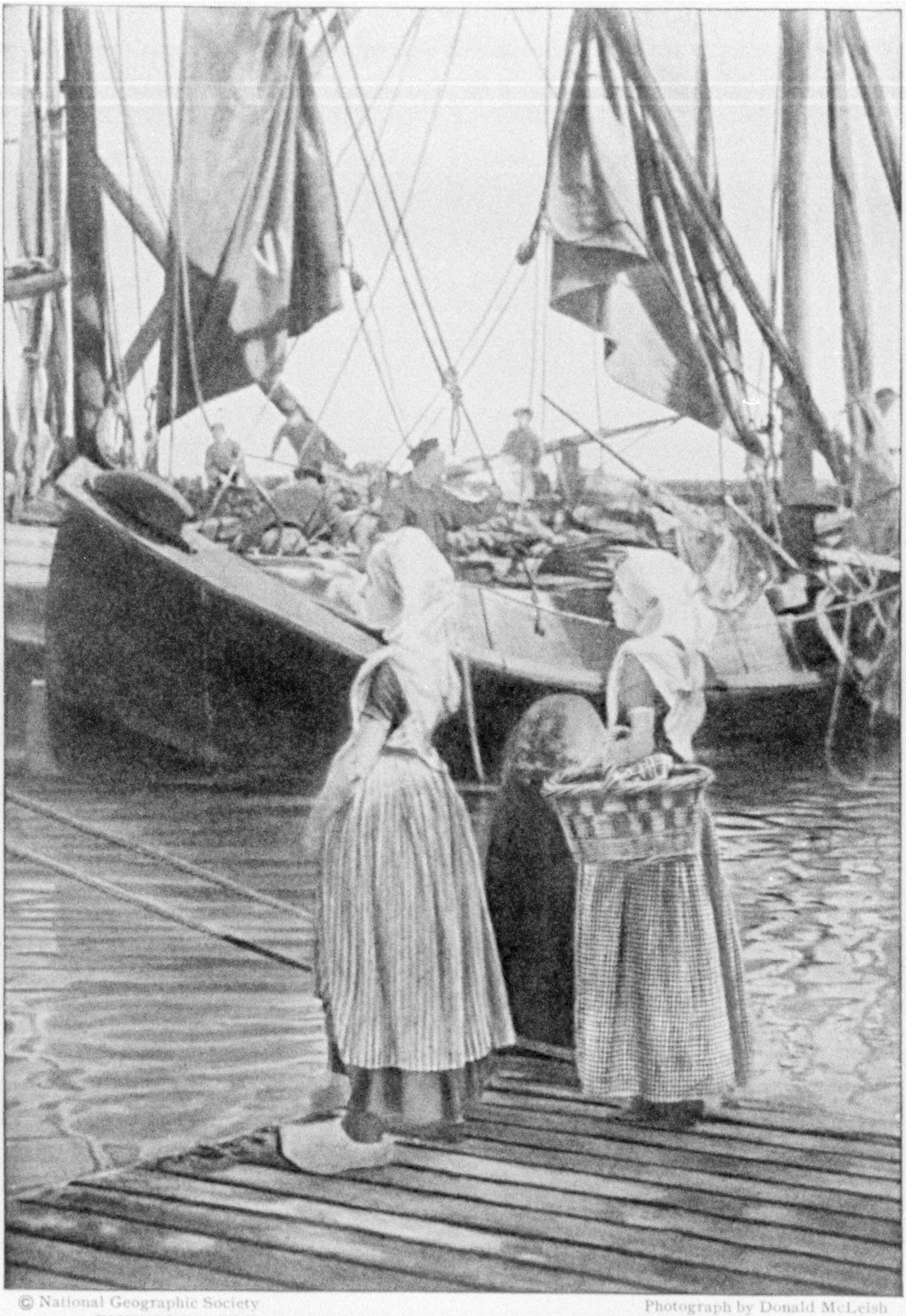
Photograph by Donald McLeish

AN APPLE IS STILL THE TEMPTER'S FRUIT

The young villagers are from Staphorst, in the Province of Overijsel, where the conservative peasantry still dress much as they did centuries ago.



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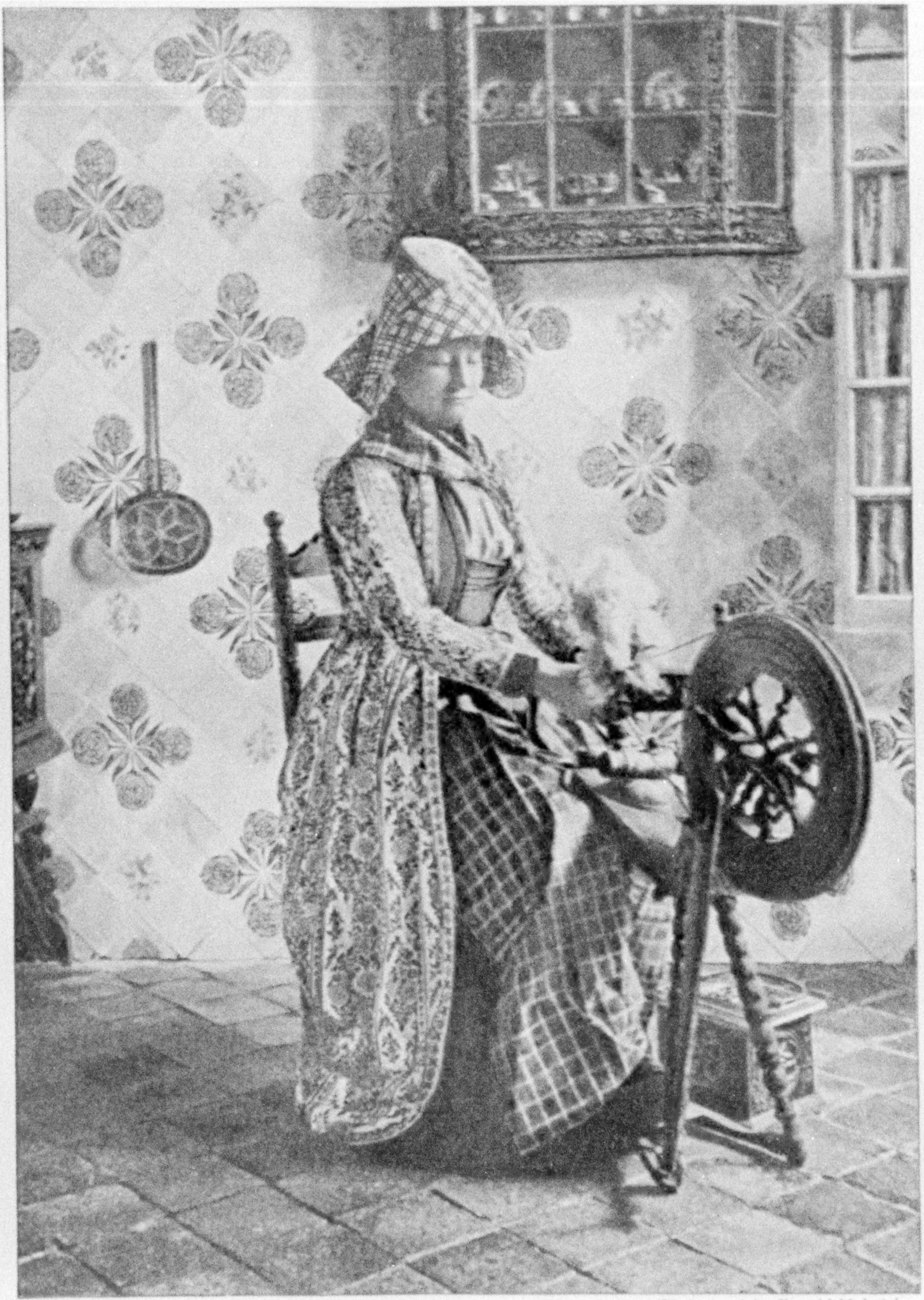
Photograph by Donald McLeish

FISHING BOATS BRING THEIR NIGHT'S CATCH TO THE QUAYS AT FLUSHING

The fishwives of Walcheren eagerly await the sea harvest that comes each morning. This port on the south shore of the island is a center for fishing fleets.



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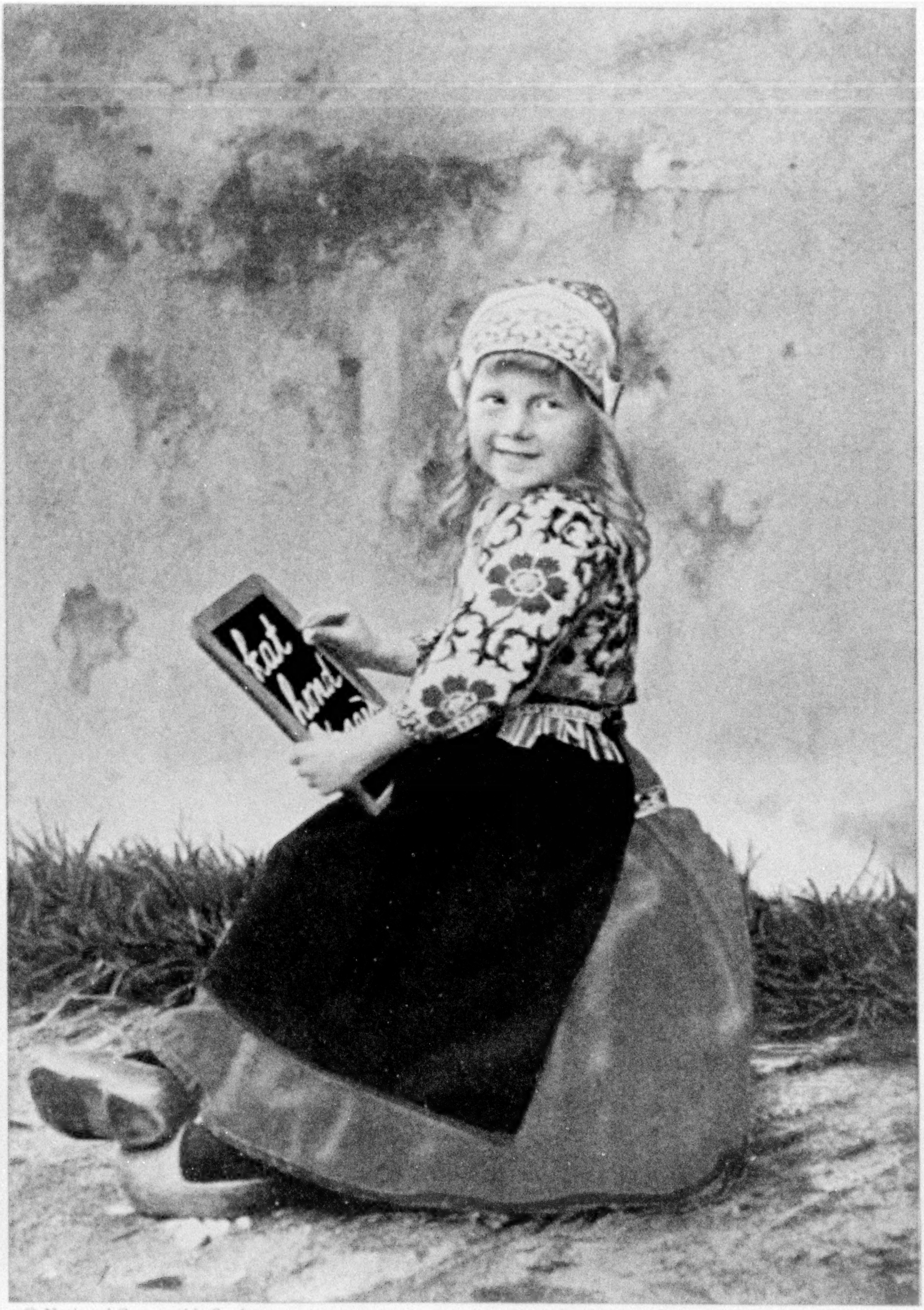
Photograph by Donald McLeish

MODERN METHODS HAVE NOT SUPPLANTED HOME INDUSTRY AT HINDELOOPEN

Some of the ways of the past still survive in this quaint Friesland village, where tiled walls and floors are numerous and the use of the spinning wheel not unknown. It is one of the world's "bric-a-brac" headquarters and many reproductions of antiques are made here.



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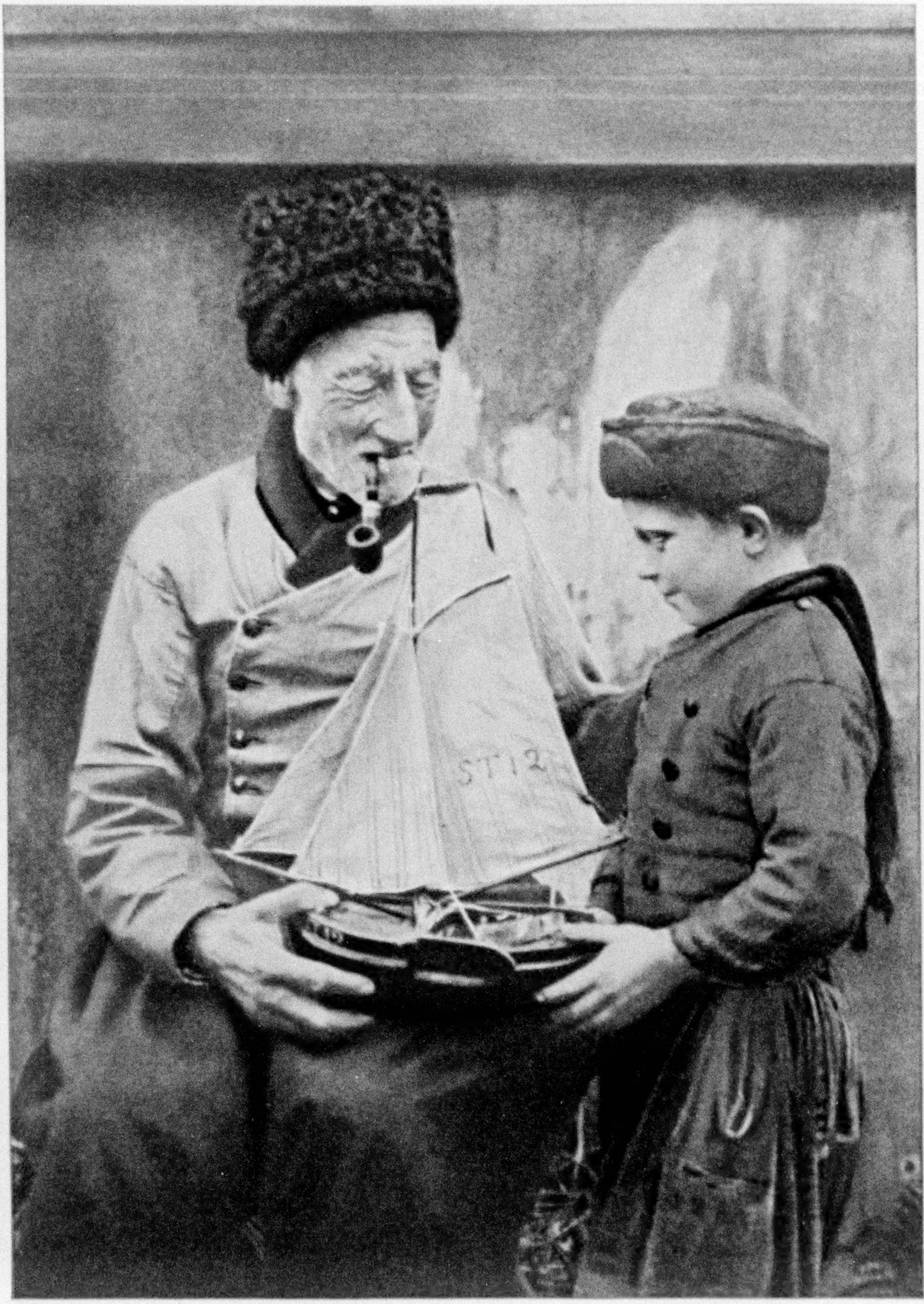
Photograph by Donald McLeish

A MERRY MAID OF MARKEN EMBARKS ON THE WAY OF KNOWLEDGE

The isle of Marken is one of the most sophisticated of Holland's show places. When reclamation of the Zuider Zee is completed, it will become a part of the mainland, but its fisherfolk will retain access to the North Sea through a canal.



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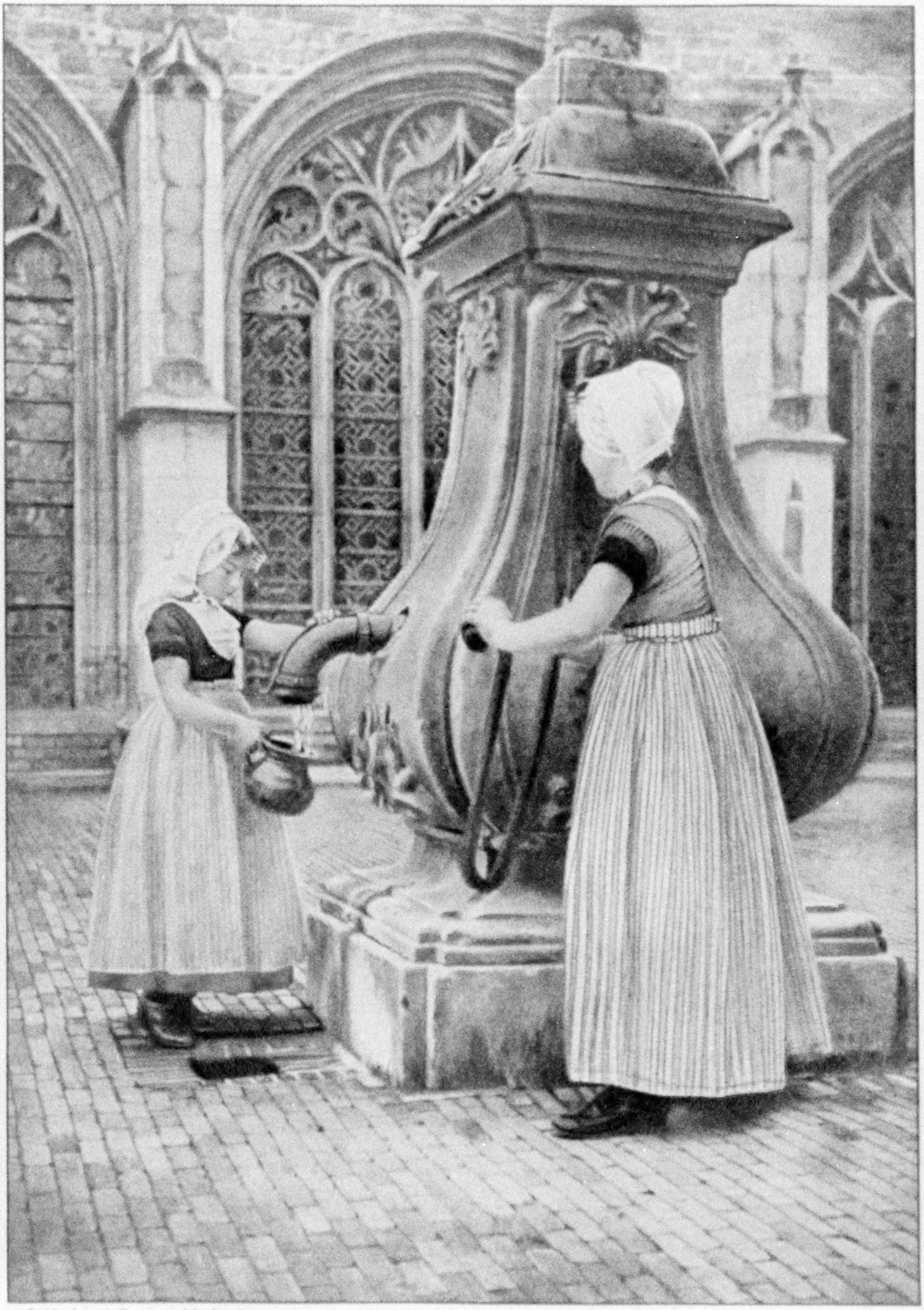
Photograph by Donald McLeish

LEARNING THE SECRETS OF THE SEA FROM A MASTER

Volendam's old mariners are well versed in ocean lore and pass their knowledge on from one generation to another. Nearly everyone in the little town, which lies on the mainland opposite the isle of Marken, draws a living from the sea, and boys begin their nautical education at an early age.



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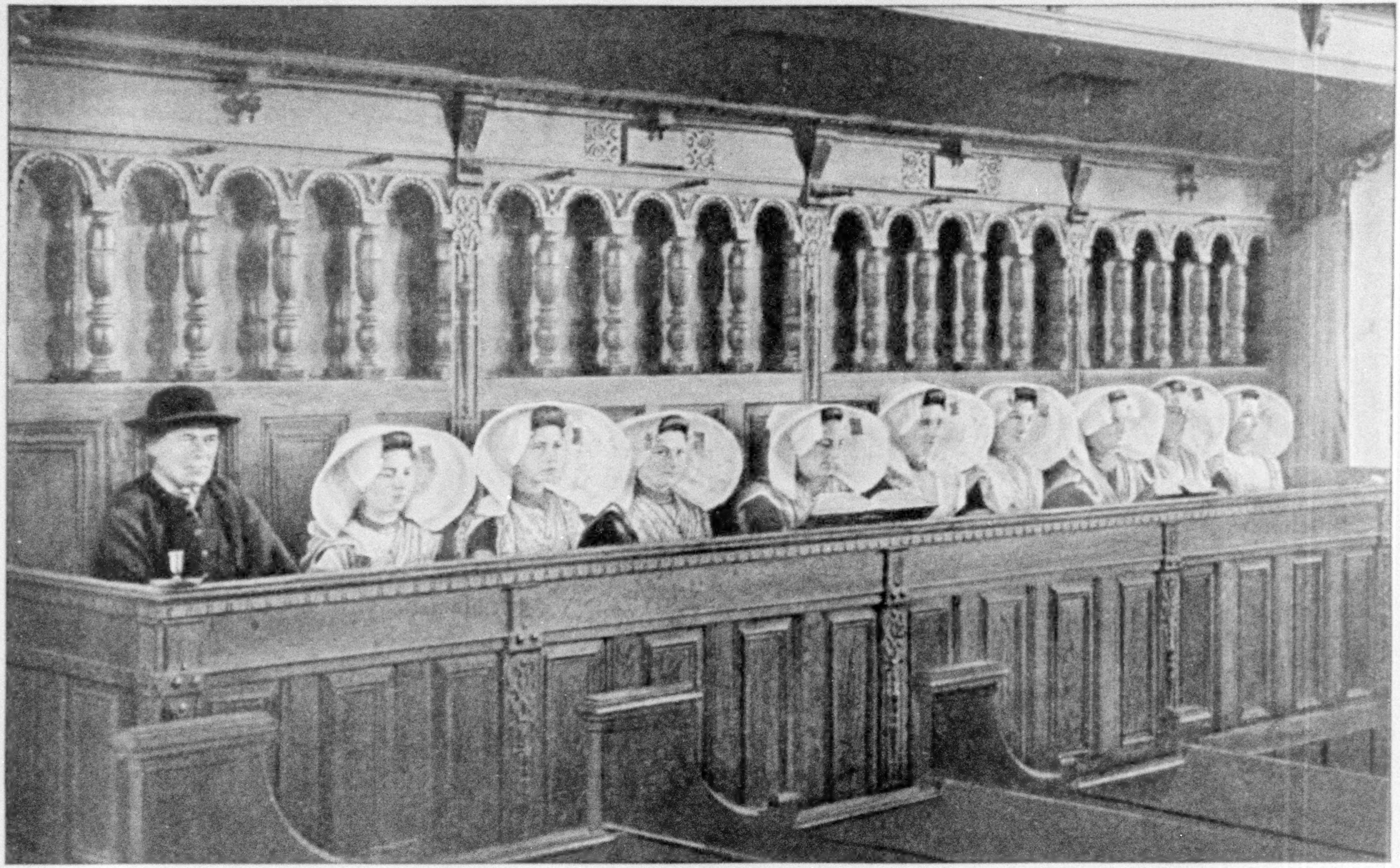
GENERATIONS OF HOLLANDERS HAVE QUENCHED THEIR THIRST HERE

The ancient Abbey of Middelburg, in the court of which this old pump stands, dates back more than seven centuries and constitutes the nucleus around which the city developed. Thursday is market day in Middelburg, and the old city appears at its best as gayly clad peasants flock into town.



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Photograph by Donald McLeish

BOTH MEN AND WOMEN WEAR THEIR HATS IN CHURCH IN HOLLAND

Despite appearances, this is not a choir visible in Zeeland, but merely a side pew in an old village church. Although services are very lengthy and of a nature to impress foreigners as perhaps a bit lugubrious, men and women of the Netherlands are strict in the observance of their religious duties.

Roads in this country are mostly of brick and are very good. In a hired automobile, costing about $25 a day, we visited North Holland. On our way to Hoorn, so called because its tower of defense from the Zuider Zee is supposed to resemble a horn, we passed whole fields of bulbs, which constitute a major industry in this country. Quantities of crocus, hyacinth, narcissus, and tulip bulbs, running high in money value, are exported yearly. Fields of these blossoms light up the landscape with great splashes of color. The tulip is undoubtedly the national flower. The name was appropriated from the Persian language and means a turban. When I see tulips I always think of bright turbans on the heads of orientals.

In the 17th century Holland became obsessed by tulips. A single "onion" of the "Semper Augustus" sold for 13,000 guilders. The Horticultural Society of Haarlem offered a prize of 100,000 guilders, equal to $40,000, for a black tulip.

Practically the whole nation became infatuated at this time, and contracts were signed for immense sums of money paid for bulbs never seen by either buyer or seller. The Government intervened, applied the law against gambling, the price of tulips fell to nothing, and a panic ensued. "The Black Tulip," by Alexandre Dumas, deals with this bulb craze.

THE SMOKER'S PARADISE

We found the Westerkerk at Enkhuizen of great interest. Besides fine carving and architecture, the sexton showed us the consistory room, which savored strongly of tobacco. About a long table each of the elders and deacons had a seat bearing his name. On the table in front of his chair was a clay pipe with a stem about two feet long, the bowl bearing the owner's name. A brass censer on the long table was used for lighting-up purposes. Evidently, My Lady Nicotine had a part in councils ecclesiastical.

Holland is the smoker's paradise. Tobacco from the East Indies is cheap and, I suppose, good. I have seen boys of ten years puffing big cigars. A good cigar costs four cents American, to-day, while before the World War it could be bought for one cent. The men are furious smokers. I heard of an old Dutchman who had smoked all his life. In making arrangements for his decease he directed that all old smokers be invited to his funeral; each was to receive a pound of tobacco and a pipe and was asked to smoke during the service. Then he arranged for his favorite pipe and a quantity of tobacco and matches to be deposited in his coffin; for, he said, "One never knows what might happen."

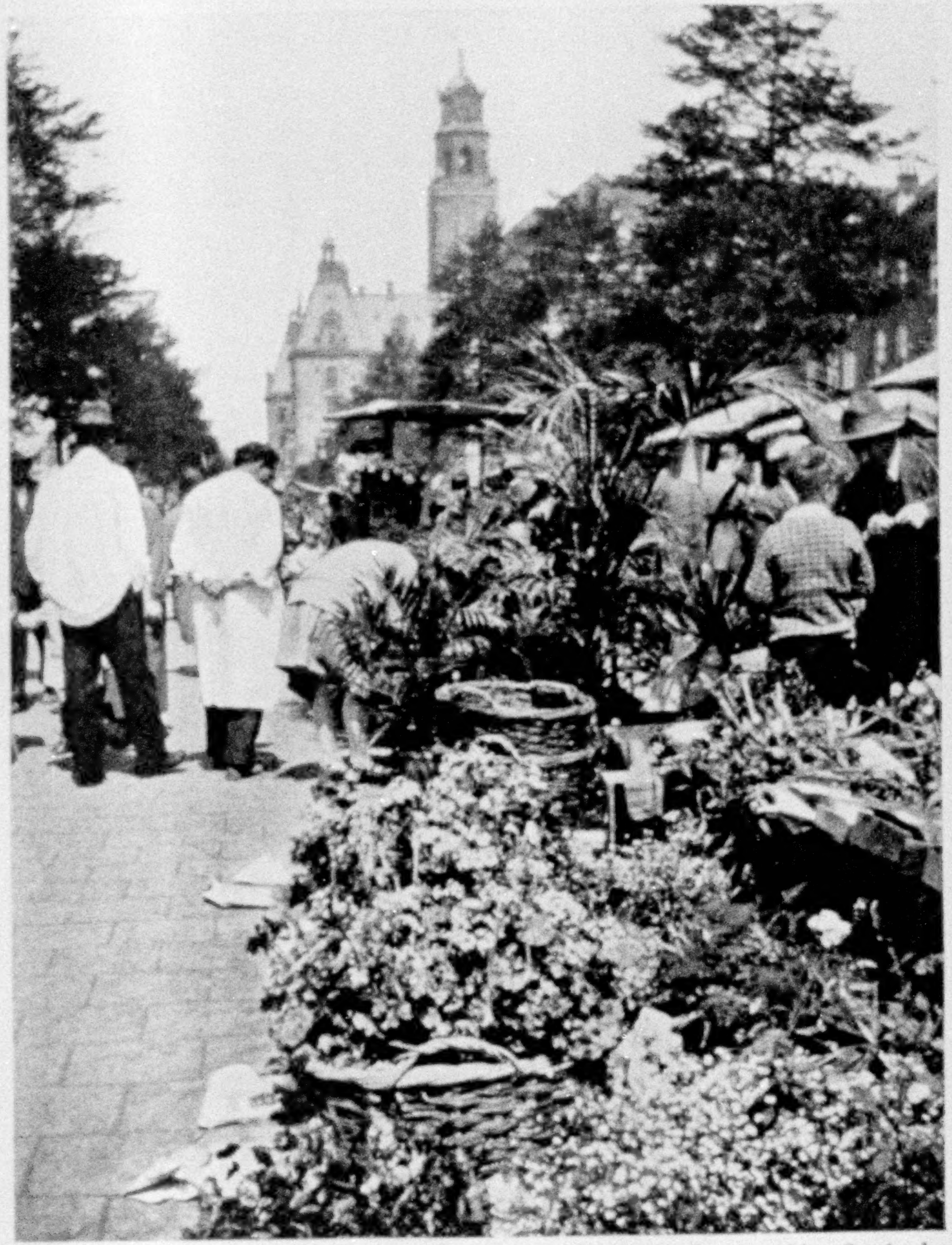
HAARLEM, CENTER OF THE BULB INDUSTRY

We went by motor to Haarlem, which is a fine city and the center of the bulb industry. Its suburbs are jeweled with flowers. The flower market is something to dream about. In visiting the Netherlands, when in villages and towns one is wise to head up first of all for the flower market.

On the way back to Zee Droom Cottage we made a long detour to The Hague, with its House in the Wood, the favorite residence of the royal family. A Hollander remarked that the house "isn't much, but it is one of the most beautifully furnished châteaux in the world." The Hague is a great overgrown village, containing many palatial residences and avenues of fine trees; but after one has seen the splendid gallery, the Mauritshuis, the Museum, and the Library, he had better pass on quickly, for guilders here fairly evaporate. Thackeray, in his "Roundabout Papers," after extolling The Hague, grumbles because he was charged a guilder (40 cents) for a bottle of ale.

On Sundays, in fine weather, Queen Wilhelmina, her consort, Prince Henry, and the Princess Juliana may be seen walking to church like any well-to-do Dutch family.

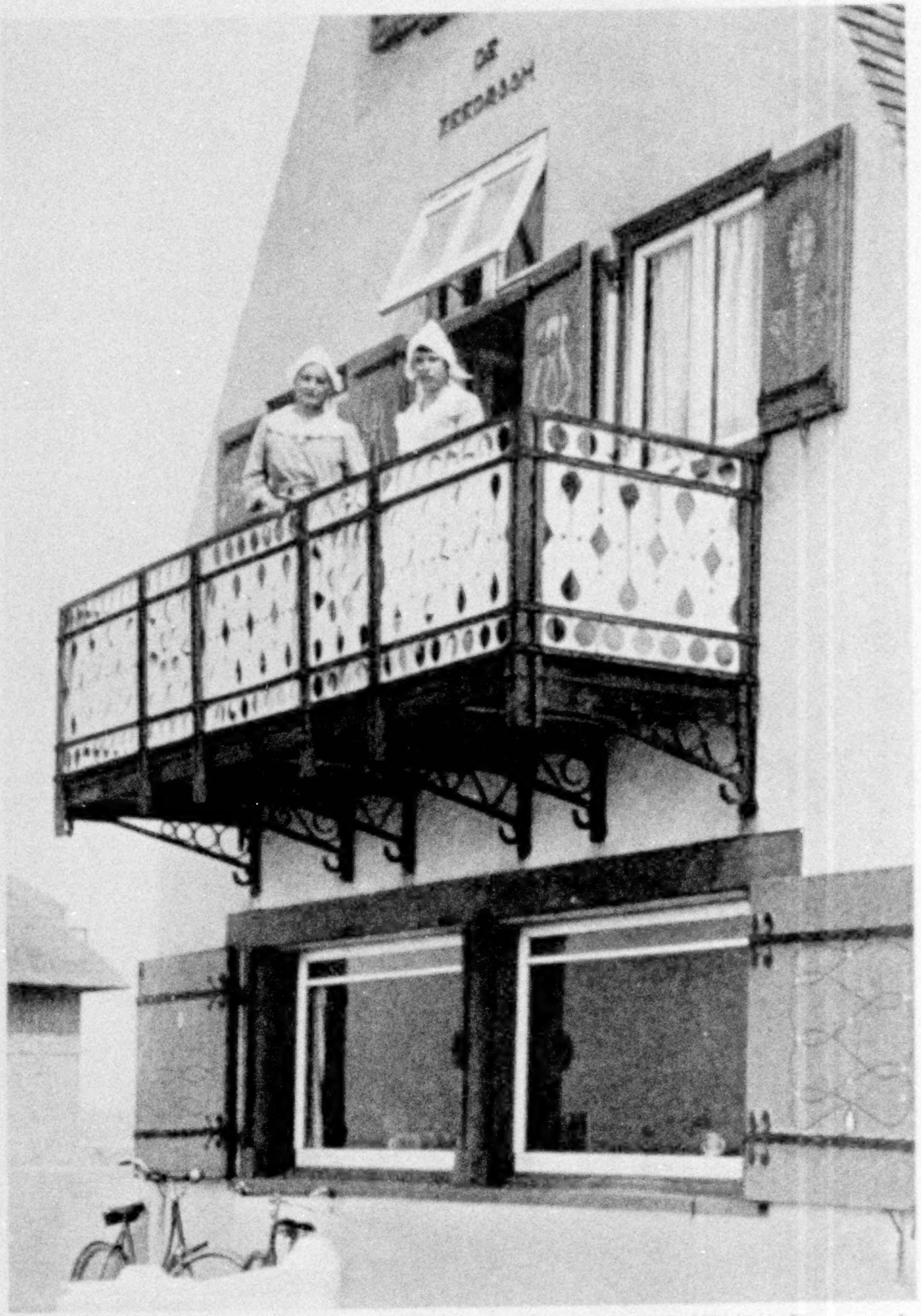
Of course, this unique country, with its quaint homes, customs, and costumes, has always been a challenge to artists. Many of the Dutch painters occupy the first rank. They are exponents of the school of realism. Rembrandt, with his great pictures, "The Lesson in Anatomy" and "The Night Watch" (more correctly known as "The Sortie of the Banning Cock Company"), with its inimitable golden light; a dead tree by Ruysdael, a bull by Paul Potter—these do not belong to the realm of mythology or imagination, but to everyday life.



Photograph by George Alden Sanford

FLOWER STALLS ARE A PART OF NEARLY EVERY DUTCH MARKET

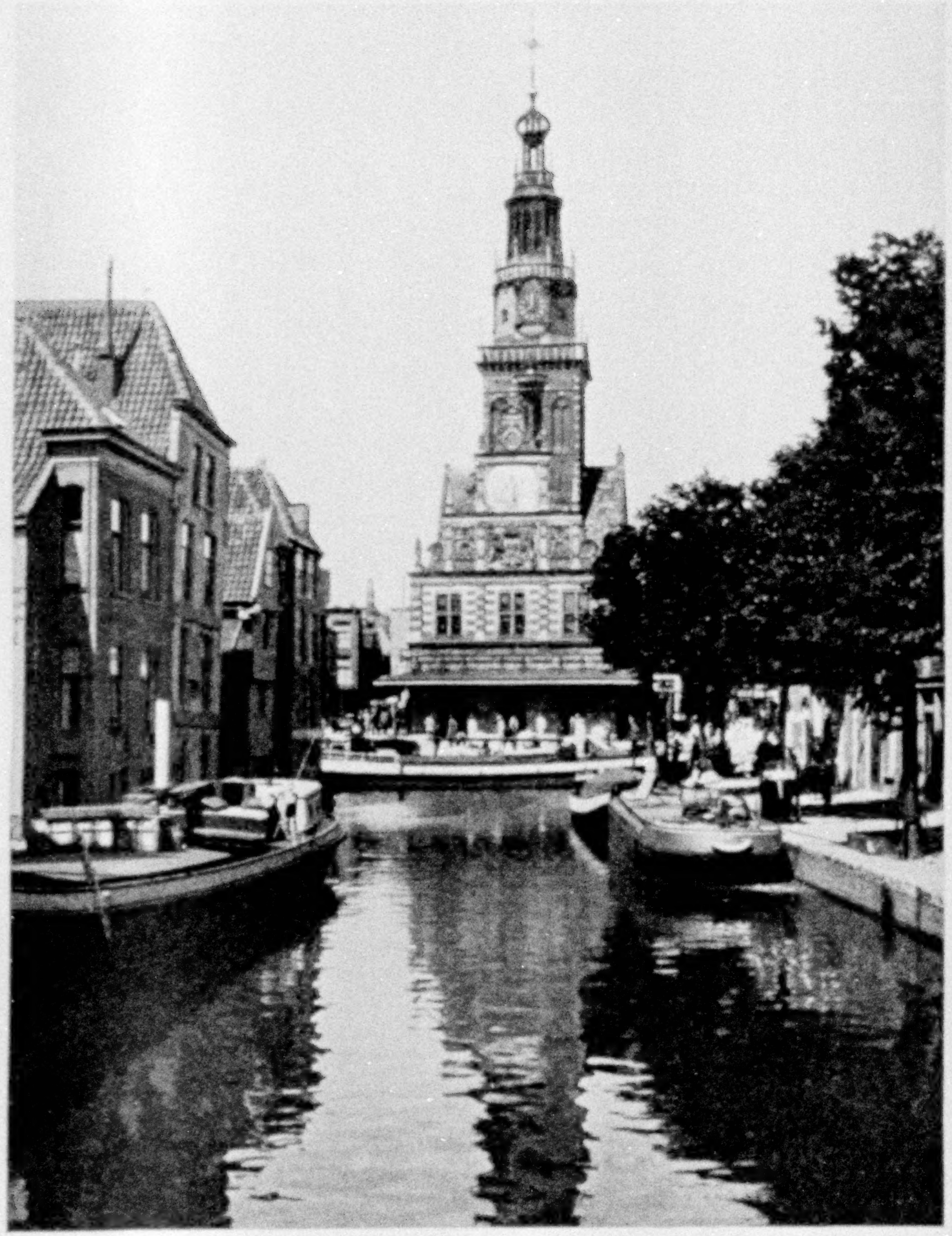
In addition to the flowers sold at markets, in many of the cities push-carts go from door to door vending the fragrant products of greenhouse and garden. In a recent year one market disposed of more than 50,000,000 blooms. These are flower stalls at Alkmaar.



Photograph by W. Van Dortmond

THE "CROW'S NEST" OF SEA DREAM COTTAGE

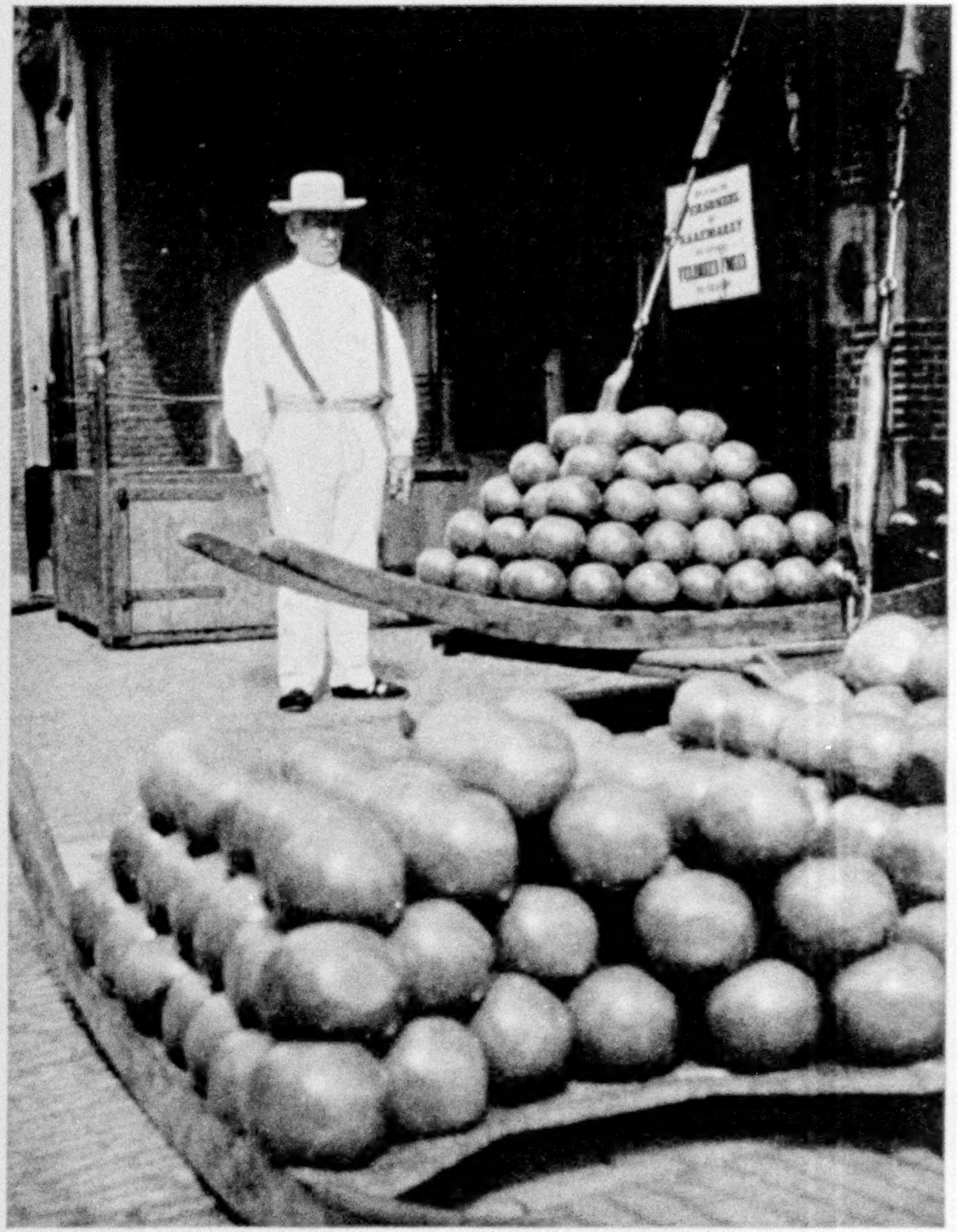
Among the sand dunes along the North Sea coast stands this brick and tile cottage which the author occupied during a summer spent in Holland. From the iron balcony, or "crow's nest," a fine view of the sea unfolds (see text, page 364).



Photograph by George Alden Sanford

ALKMAAR'S "WEIGH HOUSE" WAS ONCE A CHURCH

This interesting old building was converted to its present uses about 350 years ago. Under the canopy projecting from it are three wide doors, each giving access to a large beam scale upon which the cheeses are weighed. A fine carillon in the tower sprinkles the air with melodies.



Photograph by Emil P. Albrecht

CHEESE PORTERS ARE PERSONS OF IMPORTANCE

The white uniformed men who carry the cheese from ship to market, market to scales, and back to a ship again are elected to their positions for life by their fellow citizens. Despite hard work and small wages, the situation of porter is highly esteemed.

Delft we found to be a quiet, sleepy old town. It is the center of the tile industry.

The Nieuwe Kerk of Delft contains a magnificent monument to William, Prince of Orange, the father of his country. It consists of a recumbent sculptured figure of the Prince, in uniform, reclining on a black sarcophagus. At his left is the marble figure of his favorite dog, which gave the alarm and saved his life when he was attacked by Spanish assassins in 1572. Over the monument is a canopy, supported by four curious columns cut in marble. These represent four allegorical figures—Liberty, Justice, Courage, and Religion.

In the same church is a simple monument to Hugo Grotius, who was known as the prodigy of Europe. At the age of nine he composed good Latin verses, entered the university at twelve, and at fifteen became an ambassador.

In the Prinsenhof, residence of the Prince of Orange, where he was assassinated in 1584, a bullet-hole was pointed out. It was made by one of the two poisoned bullets fired at the great leader.

RURAL HOLLAND STILL WEARS STRIKING COSTUMES

The costumes of rural Holland are indeed unique. Women wear six or more skirts, lest the form be immodestly displayed, and a bright-colored waist with elbow sleeves, for strong, red arms are admired by men. The climax is a lace cap, the shape of which distinguishes the province in which the wearer lives.

Wives of rich farmers wear gold casques, like helmets, with ornamental gold curls. An ancient dame told us that hers cost a hundred guilders (about $40).

Workingmen wear exceedingly broad trousers, oftentimes colored vests, and short coats. Children and the poor wear *klompen*—wooden shoes. If you hear what sounds like a troop of cavalry passing down the street, it will more than likely turn out to be a group of school children returning home. Concealed weapons are not needed in Holland. In case of a row, a lad flicks off his klomp and wallops his adversary over the head. It has great weight in settling an argument.

A canal boat, tearing through the country at the rate of a mile an hour, is held up by a lock-keeper on the canal, who lets down a klomp by a kind of rod-and-line arrangement, and until the toll is forthcoming the boat passeth not.

Quite an anomalous but common sight is to see a small sailboat poking its way apparently through a field or meadow. Investigation, however, will reveal an unsuspected canal.

But, while we are junketing about, our time has slipped away and we must turn our faces homeward. We arranged to take an East India ship at Amsterdam and to be debarked at Southampton.

A GLIMPSE OF AMSTERDAM—THEN GOOD-BYE

While in Amsterdam we visited Kalver Street, one of the finest shopping streets in Europe. Here is silverwork of unusual design and workmanship—models of ships of many types; repoussé work, flat silver with windmill, stork, and other cleverly designed handles. The silver ships are used as wine-bottle holders; others are for ornament—silver sleighs, cheese-carriers, soldiers, and a multitude of other articles, tiny and beautifully wrought. To show how the Dutchman never changes, Kalver Street was so called for a calf market that once was located there. Now, although a jewelry center, it is still Kalver Street.

But our ship sails to-day and we must go to the docks. It seems strange to take a great ship of 12,000 tons in an inland city, 18 miles from the ocean; but the North Sea Canal solves that problem. It is stranger yet, at the ocean locks, to see the waters piled up from 5 to 12 feet above those of the canal, according to the tide, and with nothing to keep the inundation back but dikes and two locks, which look quite unequal to the task. The locks are opened only in calm weather.

The stewards on our East India steamer were Javanese—small, lively chaps wearing brocaded turbans. A study of the Javanese woods used in the ship's finish was of great interest. One variety, called palisander, was the most beautiful I have ever seen. It was cream-colored, with a heart and network of ebony black. I hope I shall have the good fortune to see it again.

So, good-bye Holland, with your quaint homes and ways, with your excellent and honest people, with your troops of happy children klomping along the streets, and with all your motoring and boatering.

The charm of a different soup every day!

Campbell's
Condensed
Vegetable
Soup

A glance at the list of 21 Campbell's Soups printed on the label, the selection of several different kinds, an order to your grocer! It's such an easy way to keep that precious note of newness in your menus! For tomorrow's luncheon — Campbell's Vegetable Soup — a meal in itself. 12 cents a can.

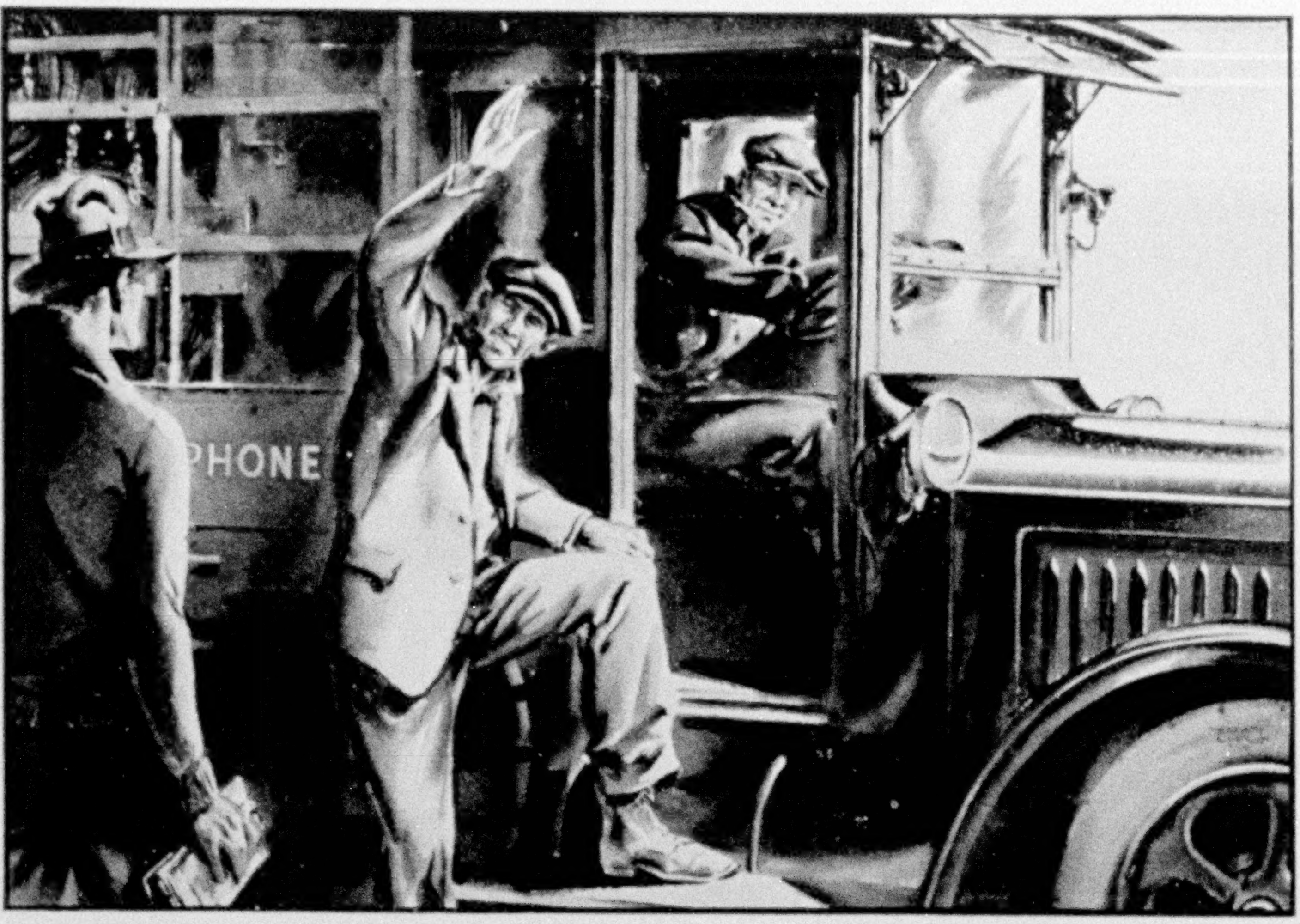
YOUR CHOICE

Order any of these Campbell's Soups from your grocer

ASPARAGUS
BEAN
BEEF
BOUILLON
CELERY
CHICKEN
CHICKEN-GUMBO (OKRA)
CLAM CHOWDER
CONSOMMÉ
JULIENNE
MOCK TURTLE
MULLIGATAWNY
MUTTON
OX TAIL
PEA
PEPPER POT
PRINTANIER
TOMATO
TOMATO-OKRA
VEGETABLE
VEGETABLE-BEEF

LOOK FOR THE
RED-AND-WHITE
LABEL

EAT SOUP EVERY DAY AND ENJOY A DIFFERENT SOUP EACH DAY



. . . IT CONTRIBUTES TO THE PROSPERITY OF THE PEOPLE AND TO THE COMFORT AND CONVENIENCE OF LIVING

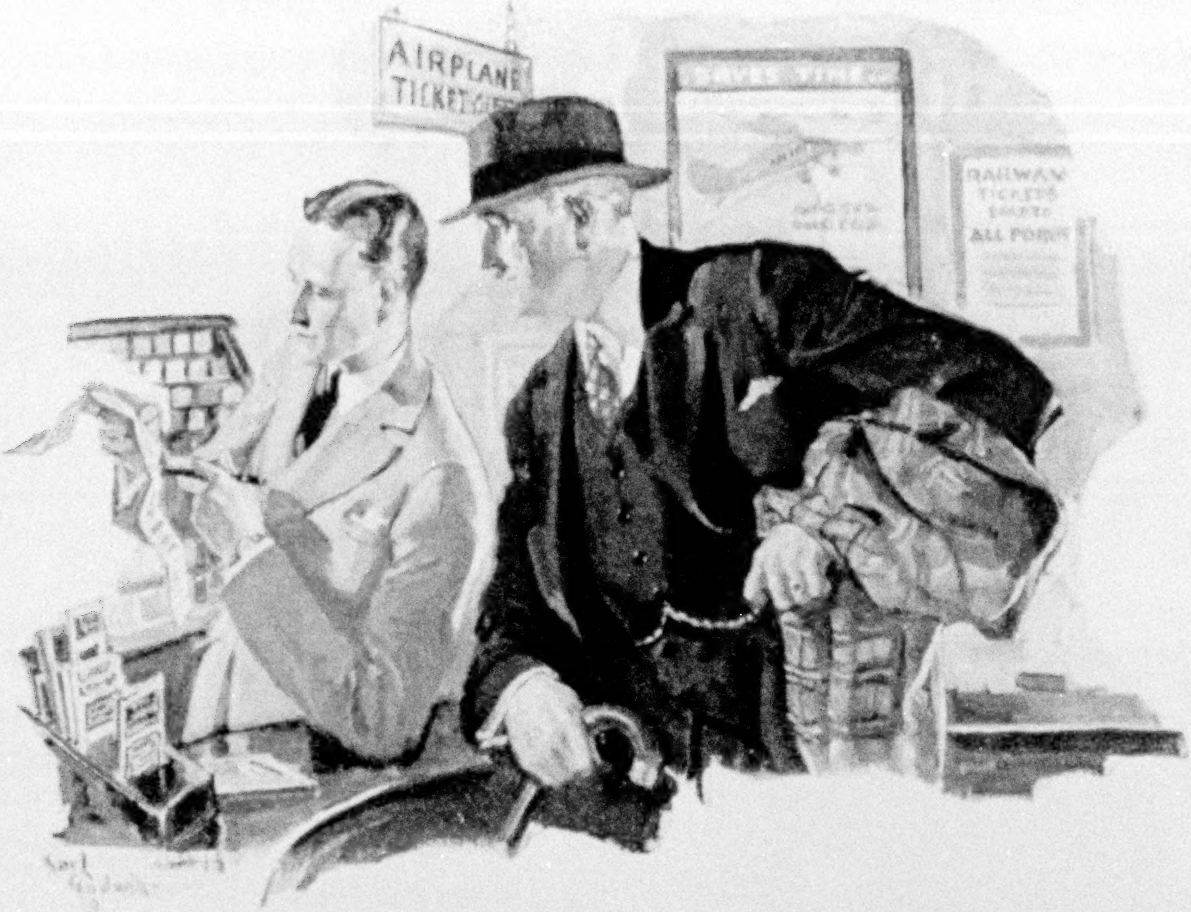
The telephone grows with the country

An Advertisement of the
American Telephone and Telegraph Company

THE Bell System must march a pace ahead of the new civilization on this continent, a civilization of better opportunity for the average man. The telephone contributes to the prosperity of the people and adds to the comfort and convenience of living.

It is used by the many. The time and money it saves are as important to the small business as to the large. The humblest home depends on it for aid in emergency, to run errands, maintain friendships. It is the aim of the Bell System to keep telephone service so good and so cheap that it will be used universally to make life richer and better. It seeks to lead the way in social and business growth. It is raising buildings this year in more than two hundred cities, adding vast mileage to the expanding network of cable, and installing new telephones by the hundreds of thousands.

It is spending more than 550 million dollars this year—one and one-half times the cost of the Panama Canal—for new plant and service improvements. This program is part of the telephone ideal that anyone, anywhere, shall be able to talk quickly and at reasonable cost with anyone, anywhere else. There is no standing still in the Bell System.



You can *buy* time or you can *save* time by investing this way

A busy executive buying an airways ticket is really *buying* time, for he must pay extra for the hours saved by these fleet pullmans of the air. The pressure of modern life gives rise to many ways of saving time — some you pay for, others are yours for the *asking*. On your investments, for example, you can save hours merely by *asking* The National City Company to put you in touch with its world-wide investment service. Call our nearest branch office. One of our experienced investment advisors will be at the other end of the wire to study your needs, help you check over your present holdings, or suggest new purchases from our widely diversified lists of securities — all thoroughly investigated by our economic experts.

THE NATIONAL CITY COMPANY
NATIONAL CITY BANK BUILDING
NEW YORK

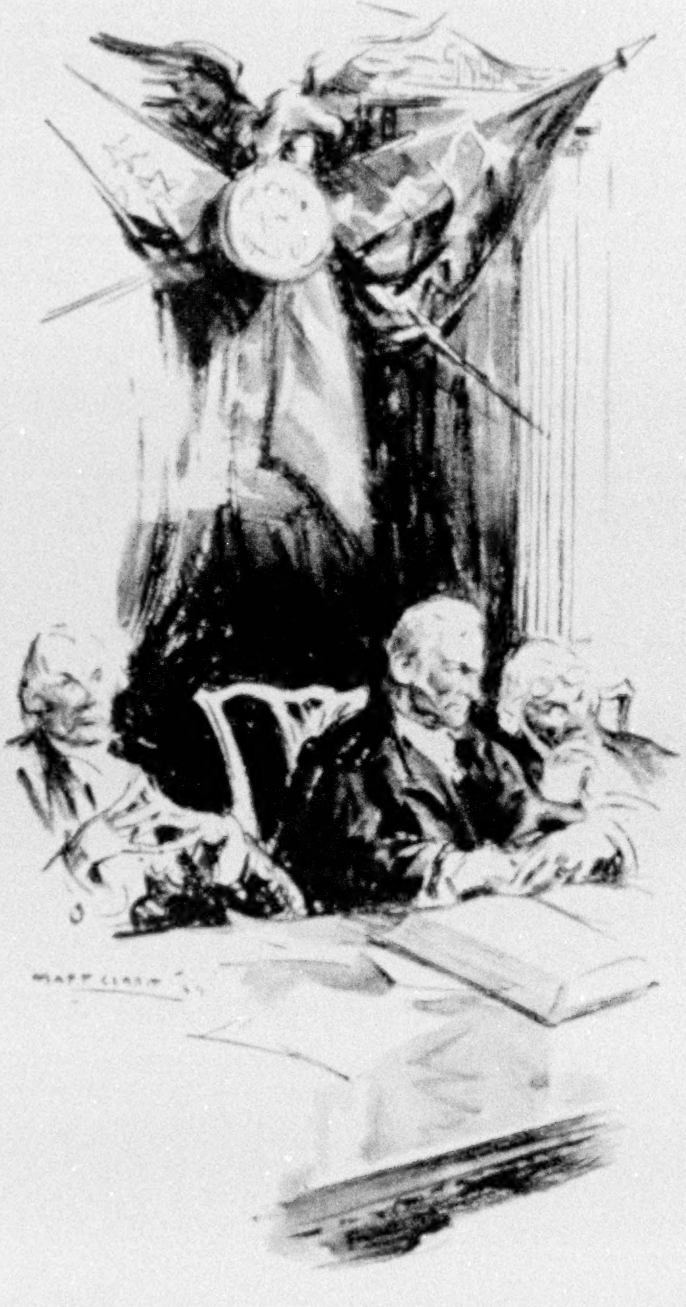
The National City Company

National City Bank Building, New York

OFFICES IN 50 AMERICAN CITIES, INTERCONNECTED BY 11,000 MILES OF PRIVATE WIRES. INTERNATIONAL BRANCHES AND CONNECTIONS

"These are Sound Principles and Will Endure"—

John Marshall in 1795



MUTUAL PROTECTION IS AVAILABLE FOR THESE CASUALTY RISKS:

- *Accident and Health*
- *Automobile (all forms)*
- *Burglary and Theft*
- *Workmen's Compensation*
- *Liability (all forms)*
- *Plate Glass*
- *Property Damage*
- *Fidelity*

ON December 26th, 1795, a group of leading citizens of Richmond, gathered to hear the report of John Marshall on a plan for the organization of the first insurance company in Virginia.

To Marshall, later great Chief Justice of the Supreme Court, and already famous as the most brilliant lawyer in the State, had been given the task of reporting on the soundness of the principles and plan.

The company organized that day was a *mutual* corporation and the principles which Marshall endorsed were the great mutual principles of ownership and management in the hands of policyholders, careful selection of risks, and furnishing reliable insurance at low cost to the insured.

John Marshall's judgment has been splendidly justified. Mutual principles have not changed to this day. Mutual corporations through sound management are able to return to the policyholders a substantial part of their insurance premium.

A worth-while booklet on mutual casualty insurance will be sent on request. No solicitation will follow. Address Mutual Insurance, Room 2200, 180 No. Michigan Ave., Chicago, Ill.

MUTUAL CASUALTY INSURANCE

These Old Line Legal Reserve Companies Are Members of

NATIONAL ASSOCIATION OF MUTUAL CASUALTY COMPANIES *and* AMERICAN MUTUAL ALLIANCE

Allied Mutuals Liability Insurance Co., *New York City;* American Mutual Liability Insurance Co., *Boston, Mass.;* Builders Mutual Casualty Co., *Madison, Wis.;* Central Mutual Casualty Co., *Kansas City, Mo.;* Employers Mutual Casualty Co., *Des Moines, Ia.;* Employers Mutual Liability Insurance Co., *Wausau, Wis.;* Exchange Mutual Indemnity Insurance Co., *Buffalo, N. Y.;* Federal Mutual Liability Insurance Co., *Boston, Mass.;* Hardware Mutual Casualty Co., *Stevens Point, Wis.;* Interboro Mutual Indemnity Insurance Co., *New York City;* Jamestown Mutual Insurance Co., *Jamestown, N. Y.;* Liberty Mutual Insurance Co., *Boston, Mass.;* Lumbermens Mutual Casualty Co., *Chicago, Ill.;* (American) Lumbermens Mutual Casualty Co. of Illinois, *New York City;* Merchants Mutual Casualty Co., *Buffalo, N. Y.;* Michigan Mutual Liability Co., *Detroit, Mich.;* Mutual Casualty Insurance Co., *New York City;* Texas Employers Insurance Association, *Dallas, Tex.;* U.S. Mutual Liability Insurance Co., *Quincy, Mass.;* Utica Mutual Insurance Co., *Utica, N. Y.*

3 NEW CHRYSLERS

TO SURPASS and thereby to render obsolete the transportation standards established by more than a quarter-century of motor car building—that is the revolutionary achievement of Chrysler engineers in these newest products of their science. ≈ ≈ There is no more basis of comparison between these latest Chryslers and cars of the past than between today's great tri-motored passenger planes and the first Wright Brothers gliders that took the air at Kittyhawk. ≈ ≈ These latest Chrysler creations are motor cars, just as the earliest and the latest air vehicles are both flying machines. ≈ ≈ There the comparison stops between Chrysler and earlier automobiles. For Chrysler again transcends all standards and ideals of power, of riding ease, of roomy luxury, of smooth operation, of quality and of value. As for beauty, Chrysler now brings to the automobile an entirely new art. Five years ago, Chrysler genius set the pace — equally revolutionary in 1924 — which the whole industry has striven since to equal. ≈ ≈ Today, Chrysler antiquates even its own accomplishment — and sets a new standard which the future cannot fail to acclaim the most astounding revolution in all motordom's history. ≈ ≈ All Chrysler dealers cordially invite you to an early inspection.

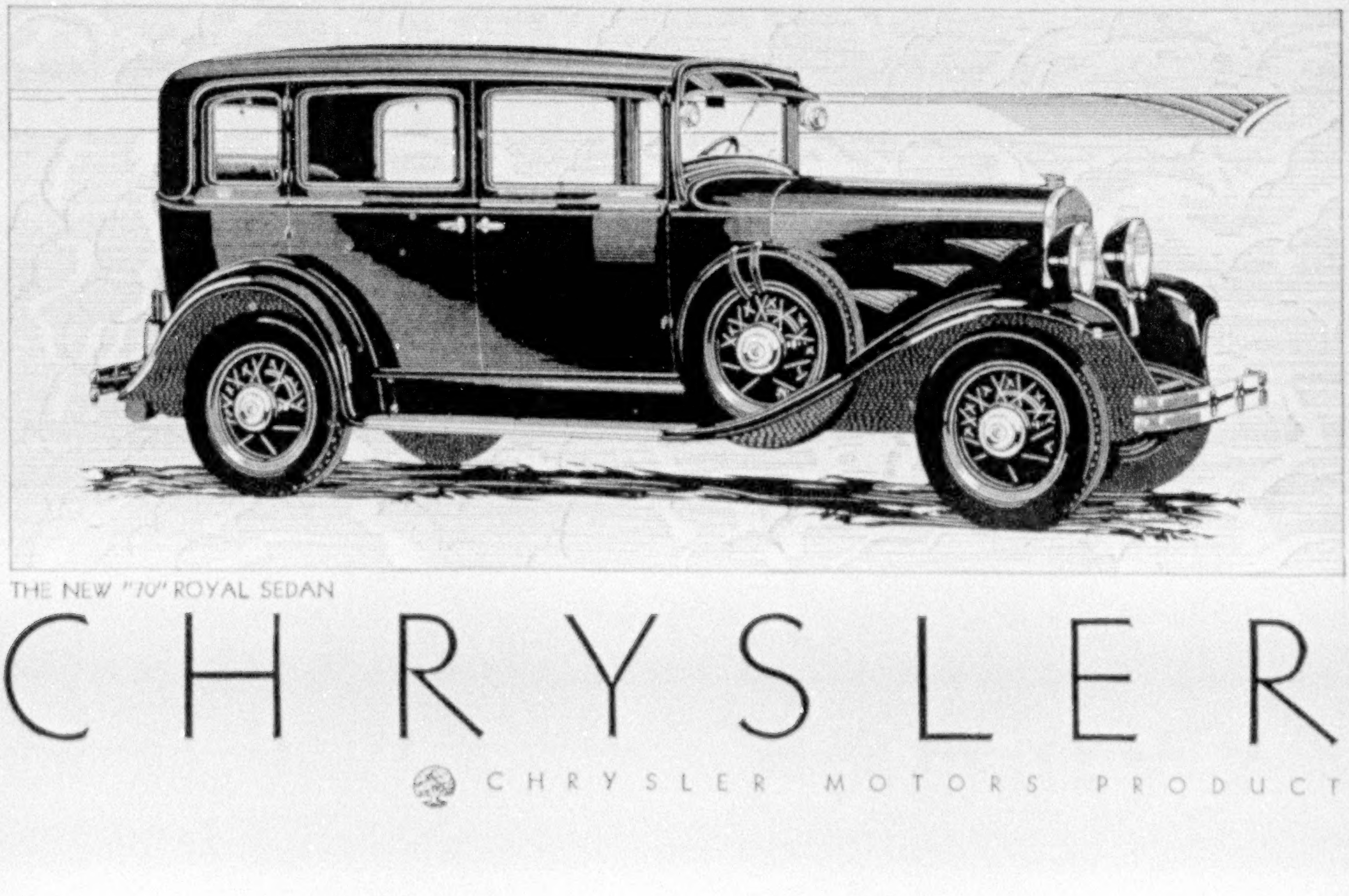
THE NEW

"77"

"70"

"66"

© 1929 Chrysler Corporation



THE NEW "70" ROYAL SEDAN

CHRYSLER

CHRYSLER MOTORS PRODUCT

Bill's going to College

A BIG MOMENT! Speaking as one man to another, there are just two words which express all the help and advice your friends and parents can give you—MAKE GOOD.

Beginning today and from now on, it's up to you. When you lose, you pay. And you're paid when you win. Fair enough.

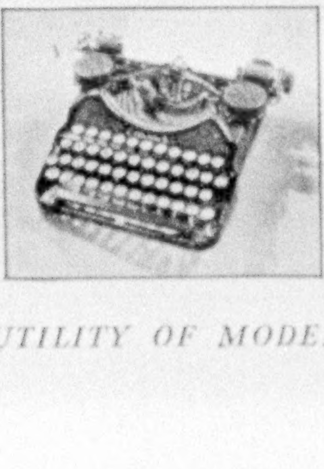
The reason we are butting in is that you need a Corona. We are not asking you to buy—we are just telling you.

Making the grade today at college without a typewriter is like trying to play football in your bare feet—or dashing a hundred in hip-length fishing boots.

Ask any professor. He'll tell you frankly that typewritten work gets better marks than handwritten. Rightly so, for typewriting induces accuracy, clear thinking, better spelling and construction. It's the modern, sensible way of putting down thoughts on paper. If Corona had been invented before pens, handwriting would be classed historically with hieroglyphics. Ask upper class men.

Think over the different things you want to make good on: class offices—typewriting is necessary; editorial work—typewriting absolutely essential; contributions to college papers—not a chance without a Corona; manager of different teams—typewriting customary; letters home for money—prospects improved if Corona-typed; and, of course, themes and written work. Seriously, a Corona will better your chance for honors at least 33⅓%.

The new Corona is the most highly developed personal writing machine made. It will do everything. A perfect mechanism. The touch is so easy and operation so convenient that many professionals prefer it to big machines. It is so durable that nothing short of tossing it out of the window will put it out of commission. And easy to learn. In a week, you can type faster than you can write—or think.



Get in touch with a Corona dealer and look the machine over. He will be glad to let you try it for a few days and will explain how you can pay for it gradually. Or isn't there someone who is interested in your success who would be delighted to contribute this vital tool?

Corona with standard keyboard costs $60. Corona Special with three-row keyboard (a great little machine) costs $39.50.

Both models come in a variety of attractive colors, complete with a sturdy carrying-case.

L C Smith &
Corona Typewriters Inc,
51 Madison Ave.,
New York,
N.Y.

CORONA · *A UTILITY OF MODERN LIVING*

These VITAL FEATURES
.. make a car truly modern

and WHIPPET IS THE
ONLY LOW-PRICED SIX
THAT HAS THEM *ALL!*

7-BEARING CRANKSHAFT
EXTRA LONG WHEELBASE
FULL FORCE-FEED LUBRICATION
SILENT TIMING CHAIN
INVAR-STRUT PISTONS
"FINGER-TIP CONTROL"
BIG 4-WHEEL BRAKES

THE experience and progress of twenty-two years of building quality motor cars have entered into the construction of the new Superior Whippet Six—the Six that is giving thousands of owners an advanced idea of automobile value. In addition to being the only inexpensive Six with *all* the fundamental advantages listed at the left, the new Superior Whippet is also stronger and safer, having more frame cross members and a larger braking area than any of its competitors.

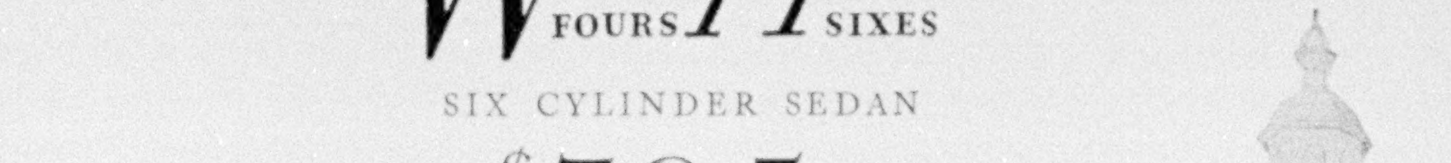
WILLYS-OVERLAND, INC., TOLEDO, O.
Willys-Overland Sales Co., Ltd., Toronto, Canada

NEW SUPERIOR *Whippet*
FOURS SIXES

SIX CYLINDER SEDAN

$785

Coach $725; Coupe $695; Coupe (with rumble seat) $725; De Luxe Sedan $850; Sport De Luxe Roadster $850 (with rumble seat and extras). The Four Coach $575; Coupe $575; 4-pass. Coupe $605; Sedan $630; De Luxe Sedan $695; Roadster $525; 4-pass. Roadster $555; Collegiate Roadster $505; Touring $520; Commercial Chassis $405. All Willys-Overland prices f. o. b. Toledo, Ohio, and specifications subject to change without notice.



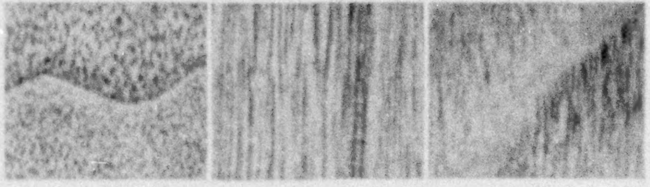
This ONE FACT well learned may save you years of disappointment

OF ALL the *things* that enter into your life, none is more intimate than furniture; none has the capacity for enduring satisfaction or for lasting disappointment.

You can be sure of enduring satisfaction by insisting upon genuine American Walnut in any furniture that you buy. Choose your style carefully—a style that attracts you, that is simple, chaste, the sort of thing that you will want to live with as a friend, day in and day out, through the years.

Then be sure that the beauty of that style is enhanced by the beauty of genuine American Walnut. It is your best assurance of good value and of excellence of workmanship—for furniture builders put only the best workmanship on the best materials.

There is no finer cabinet wood than American Walnut—any reputable dealer will verify this for you. No other is more proof against the ravages of wear. American Walnut's color is grown in the wood itself, not painted on its surface. And no other wood will be so easy to keep looking its best through all the long years of its life.



You can always identify American Walnut by the pores. They show as dots, as fine pen lines or as short dashes—depending upon the direction in which the wood has been cut; but the pores are always evident.

You can learn to identify genuine American Walnut quickly and easily, simply by learning the tell-tale appearance of the little pores which are always visible to the naked eye in genuine American Walnut. Just fill in this coupon and send it to us for your copy of the beautiful 48-page "Story of American Walnut." It will show you how to distinguish American Walnut from its substitutes. It will give you invaluable advice on furnishing your home. And it contains a most instructive chapter on the care and finish of furniture. A copy is yours, just for the asking.

AMERICAN WALNUT

AMERICAN WALNUT

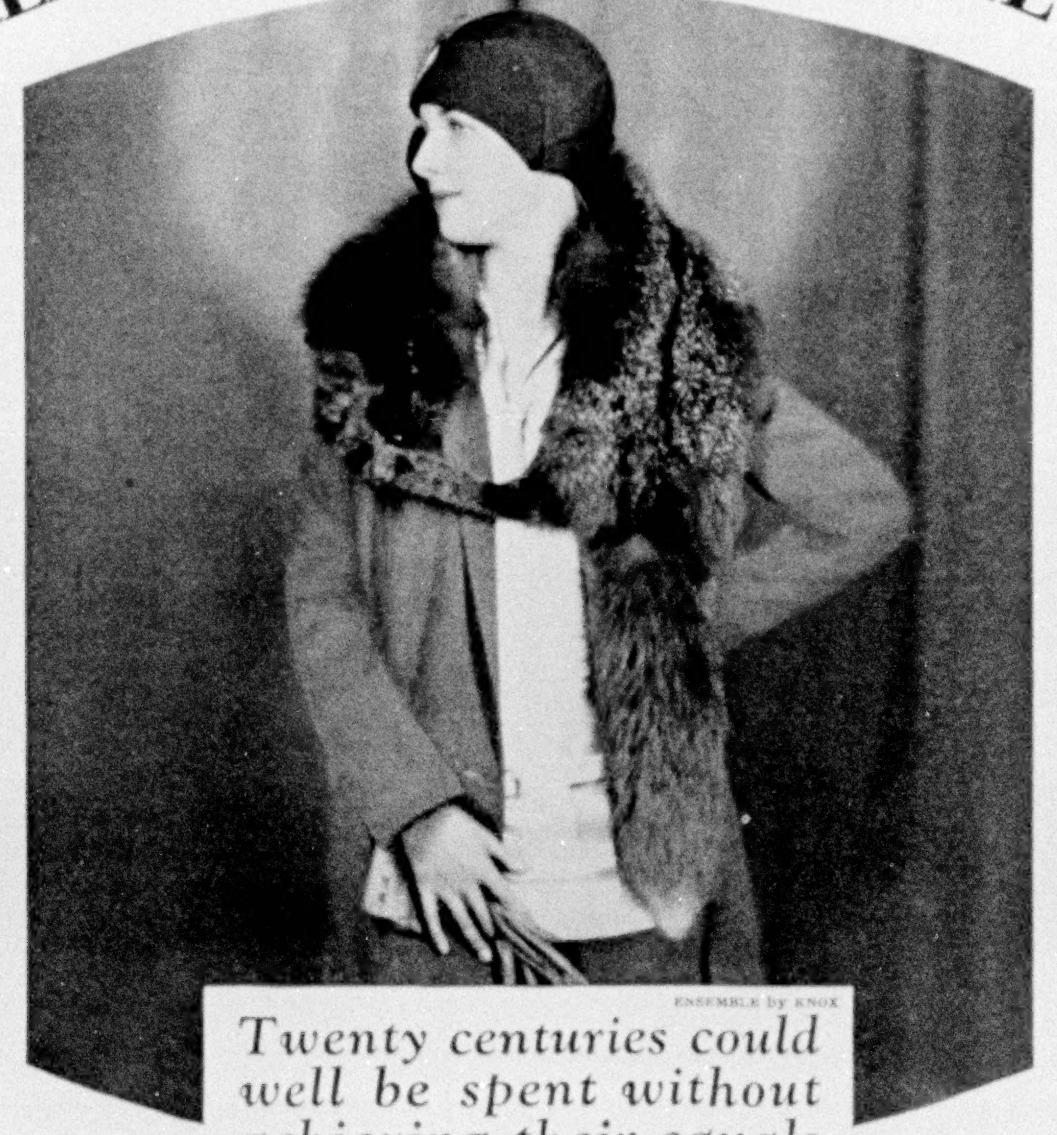
American Walnut Manufacturers
Association

Room 2708, 616 S. Michigan Ave.
Chicago, Illinois

Please send me your brochure "The Story of American Walnut."

Name.. *Address*..

TWENTY YEARS WERE NEEDED TO CREATE THESE MASTERPIECES

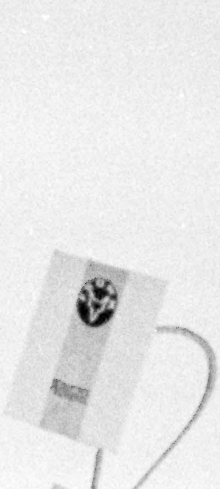


ENSEMBLE by KNOX

Twenty centuries could well be spent without achieving their equals

Twenty years ago, the Fromm brothers settled in a snow swept clearing in the northern forest of Wisconsin, for the purpose of producing the finest strain of silver fox that man's intelligence, coupled with nature, could create. For twenty years they labored, struggled, experimented—to triumph finally and gloriously, with the full-furred, silky, perfectly marked pelts that comprise the present collection of Fromm Pedigreed Silver Foxes.

These men have the secret of breeding, raising and pelting perfect silver foxes—a secret won from the teeth of the northern gale. Theirs is the ability to share in the creation of rare treasures of furdom. Twenty years it took them to gain the heights—and in the twenty years, thousands of other fox farmers attempted to equal their achievement—and failed. For twenty centuries could well be spent without approaching the perfection that these men's skill and patience have attained. Go to your furrier—and enjoy for yourself the glory of a Fromm Pedigreed Silver Fox Scarf—the beauty born of twenty eventful years in the far north woods.



Return the medallion that identifies your scarf to Fromm Bros.—and receive pedigree—describing the scarf you have purchased.

FROMM PEDIGREED SILVER FOXES

are the result of twenty years of scientific fox farming in northern Wisconsin. Each is a full and silky, perfectly marked, masterpiece of fur. Like all real treasures, these pelts are limited in quantity, only 7665 of them having been bred this year. Each is identified by the medallion shown—and the whole fascinating story of the twenty years of creation behind each Fromm Pedigreed Silver Fox is told in the black and silver book which will be sent to you gratis—if you request it on the coupon. Fromm Bros., Hamburg, Wis.

FROMM BROS. N. 9—29
Hamburg, Wisconsin

Gentlemen:
Send me booklet on Fromm Pedigreed Silver Foxes. This entails no obligation on my part.

Name ....

Address ....

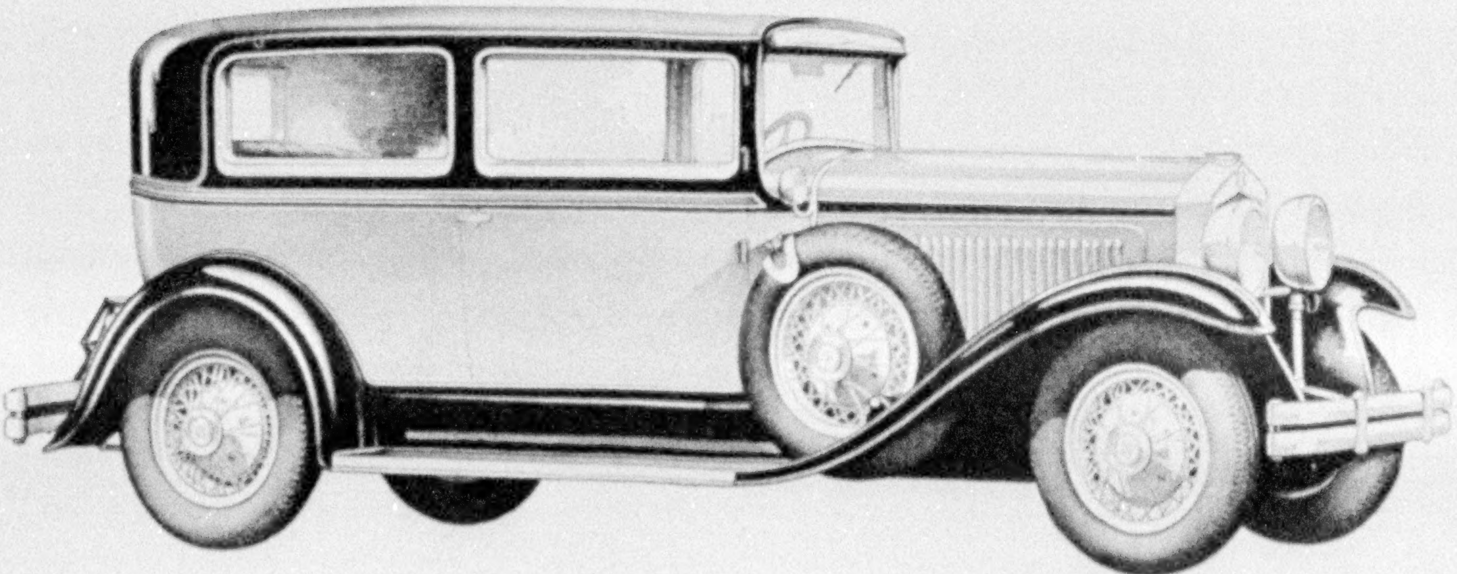
An outstanding triumph of a pre-eminent firm

JUDGING by its appearance, you would instantly classify the Dodge Senior as a car selling for well over $2,000. Yet the unique facilities of Dodge Brothers, fortified by the well-nigh unlimited resources of Chrysler Motors, make it possible to produce this marvelous car to sell in the $1,500 class. The Dodge Senior is undeniably one of the greatest manufacturing triumphs just as it is one of the most impressive values of all automotive history. Three or four-speed transmission.

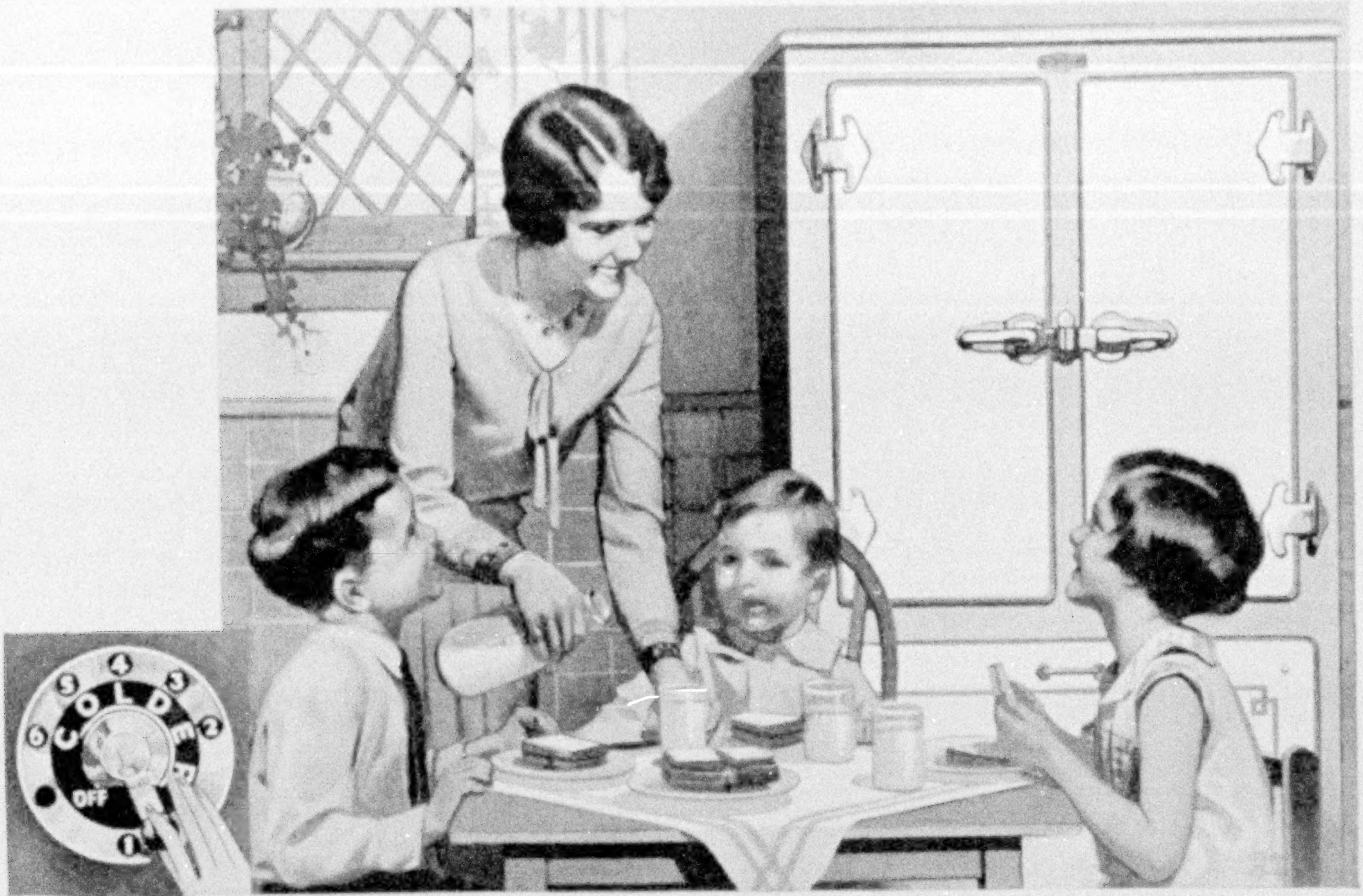
Convenient Terms

DODGE BROTHERS SENIOR

CHRYSLER MOTORS PRODUCT



Dodge Senior Brougham (*wire wheels extra*)



You'll want the added features *offered only by Frigidaire*

YOU'LL prefer the larger ice cubes that freeze faster in Frigidaire.

You'll want the Frigidaire "Cold Control" . . . the simple patented device that enables you to regulate at will the freezing time.

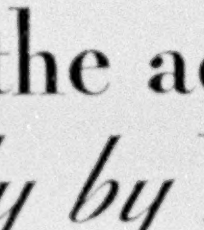
You'll want the added certainty, the priceless protection to health offered by the powerful Frigidaire compressor.

You'll be glad that this quiet compressor is completely out of sight and out of the way in the base of the cabinet . . . away from dust and dirt. You'll find it immeasurably convenient to have food shelves you can reach without stooping . . . to have a cabinet lined with seamless Porcelain-on-steel . . . to have a refrigerator that's designed by people who understand what women need in housekeeping.

In other words, you'll prefer Frigidaire for the same reasons that have led more people to buy Frigidaire than all other electric refrigerators combined.

Call at the local Frigidaire display room. You will be amazed by the new low prices and by the liberal General Motors terms.

And . . . today . . . mail the coupon for the new Frigidaire catalog and a copy of the book of recipes for making frozen delicacies.



FRIGIDAIRE CORPORATION,
Subsidiary of General Motors Corporation,
Dept. Y-320, Dayton, Ohio.

Please send me a free copy of the Frigidaire catalog and the recipe book of frozen delicacies.

Name . . . .

Address . . . .

If you live in Canada, address Frigidaire Corporation,
1604 Sterling Tower, Toronto, Ontario.

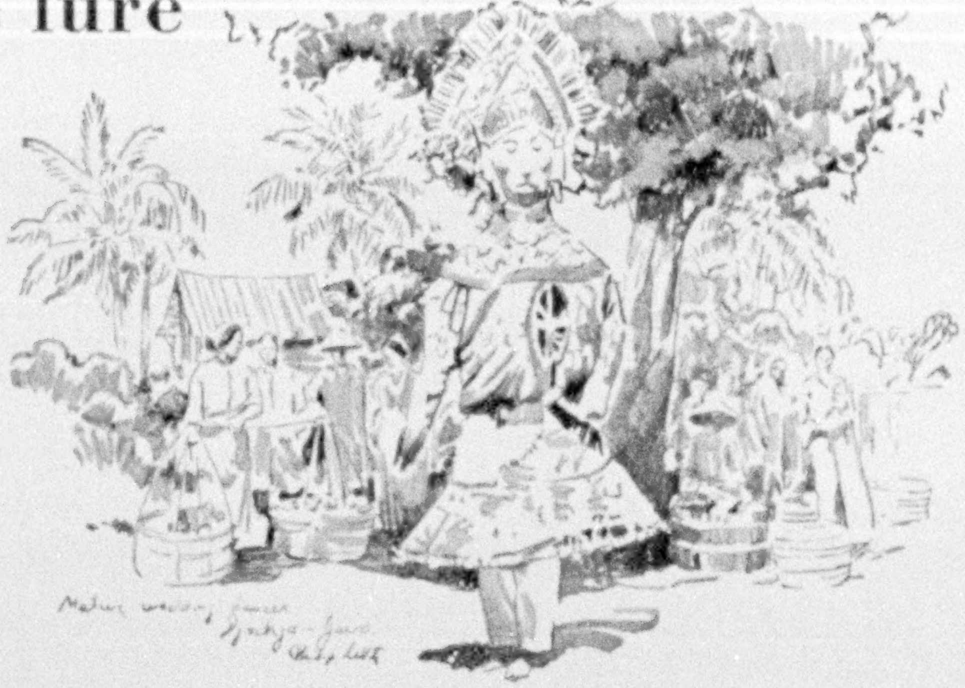
FRIGIDAIRE

More than a **MILLION** *in use*

We endorse the national food preservation program initiated by the National Electric Light Association.

Plan Days in Java

to learn the lure of this tropic isle



From SINGAPORE it is but a step across to the Dutch East Indies, which have fittingly been described as "a necklace of emeralds strung along the equator". Long, slender Java, swarming with more than thirty million picturesque peoples of the East, is a world in itself. Besides its vast plantations of sugar, coffee, indigo, rubber, it presents tropical scenes rarely surpassed. Yet Java is well governed and easily traveled, with splendid roads and some 3500 miles of railways, divided into two native principalities, yet all under the security of Holland.

Batavia, canal-filled as any city of Holland proper, is far-famed for its exotic air. Buitenzorg, the summer capital, not far away yet higher up, has a botanical garden justly renowned to the ends of the earth. Then there is Djokjakarta, whose ruler boasted two hundred wives and hundreds of children at last inventory, where tiger baiting is a favorite sport, to say nothing of a race meeting every spring to which Europeans come from everywhere in that corner of the globe.

COMPLETE INFORMATION FROM ANY STEAMSHIP OR TOURIST AGENT

AMERICAN MAIL LINE AND DOLLAR STEAMSHIP LINE

25 AND 32 BROADWAY . NEW YORK
604 FIFTH AVE. . NEW YORK, N. Y.
210 SO. 16TH ST. . PHILADELPHIA
177 STATE ST. . BOSTON, MASS.
110 SO. DEARBORN ST. . CHICAGO
514 W. SIXTH ST., LOS ANGELES, CAL.
1005 CONNECTICUT N. W., WASH., D.C.
DIME BANK BUILDING . DETROIT
ROBT. DOLLAR BLDG. SAN FRANCISCO
HONG KONG

UNION TRUST ARCADE . CLEVELAND
152 BROADWAY . PORTLAND, ORE.
21 PIAZZA DEL POPOLO, ROME, ITALY
11 BIS RUE SCRIBE . PARIS, FRANCE
22 BILLITER STREET, E.C. 3, LONDON
909 GOVERNMENT ST., VICTORIA, B.C.
517 GRANVILLE ST., VANCOUVER, B.C.
4TH AT UNIVERSITY, SEATTLE, WASH.
YOKOHAMA KOBE SHANGHAI
MANILA

And no journey to the East would be complete without a glimpse of Borobudur, greatest of Hindu temples. Picture to yourself a structure that is really a hill rising a hundred and fifty feet above the plain, the lower terrace five hundred feet long, with statues, exemplifying Hindu art at its height, so numerous that stood side by side they would reach for three miles; bas-reliefs compared with which any in Europe seem the mere scratchings of the cave men. . . .

And on the east, opposite the unforgettable city of Sourabaya, lies the peerless island of Bali, where the Hindu worship which Mohammedanism has driven out of Java proper still persists. Troops of Malay comedians whom even sophisticated travelers find the most laugh-provoking on any stage . . . crocodile insurance as a regular business . . . and farther on, jungles blazing with fire-trees, flashing with birds of paradise. . . .

Harry A. Franck

You go as you please Round the World under the advantages offered by this unique steamship service. Stop where you wish for as long as you like within the two-year limit of your ticket. Your fare, including meals and accommodations aboard ship, as low as $1250 Round the World.

Every week a palatial President Liner sails from Los Angeles and San Francisco for Honolulu, Japan, China, Manila and thence on fortnightly schedules to Malaya,—Java 36 hours away—Ceylon, Egypt, Italy, France, New York.

Fortnightly sailing from New York via Havana and Panama to California thence Round the World.

Every fortnight a similar Liner sails from Seattle and Victoria, B. C., for Japan, China, Manila and Round the World.

Magnificent Liners, they offer outside rooms with beds, not berths. Spacious decks. A swimming pool. Luxurious public rooms. A world-famous cuisine.

FREE!

10-day supply

Have teeth dazzling white

Please accept the special formula to remove film on teeth. Film is the cause of dull, discolored teeth. It is the basis of decay and pyorrhea. Just send the coupon for the best way to combat it.

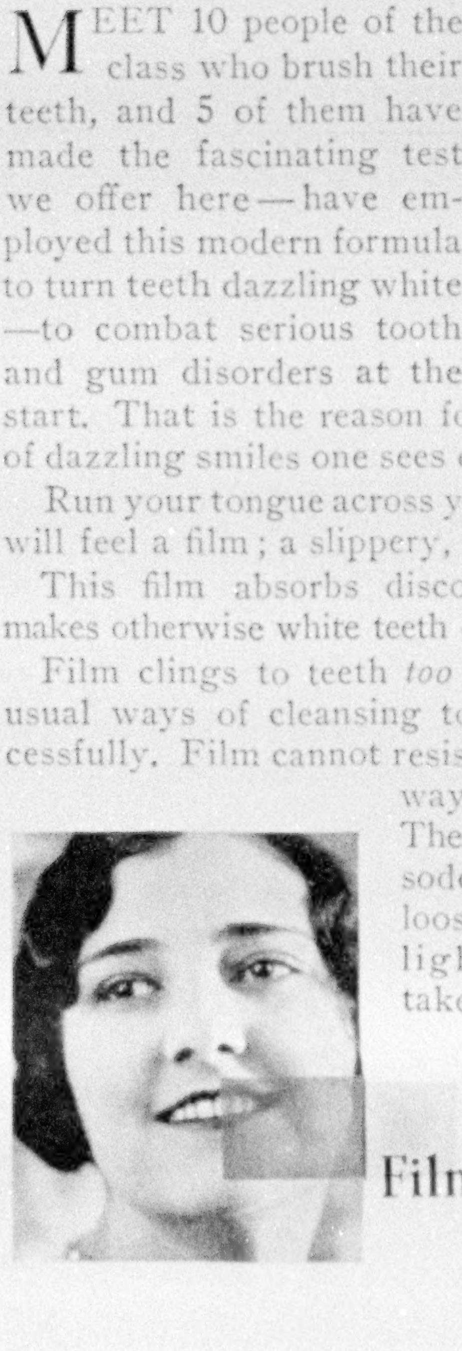
Pepsodent
Pepsodent

MEET 10 people of the class who brush their teeth, and 5 of them have made the fascinating test we offer here—have employed this modern formula to turn teeth dazzling white—to combat serious tooth and gum disorders at the start. That is the reason for the millions of dazzling smiles one sees on every hand.

Run your tongue across your teeth. You will feel a film; a slippery, slimy coating.

This film absorbs discolorations and makes otherwise white teeth dull and dingy.

Film clings to teeth *too stubbornly* for usual ways of cleansing to combat successfully. Film cannot resist brushing the way it did before. The agents in Pepsodent curdle and loosen film so that light brushing takes it off.



Film discolors teeth and fosters serious tooth and gum disorders.

Give Pepsodent free 10-day test

If teeth are dull, "off color," that is film. If you are prone to tooth and gum disorders, that may be film also. Remove this film for ten days and see teeth lighten.

Get a large tube wherever dentifrices are sold. Or send free coupon.

FREE 10-DAY TUBE

Mail coupon to

The Pepsodent Co.,
Dept. 199, 1104 S. Wabash Ave.,
Chicago, Ill., U. S. A.

Name..

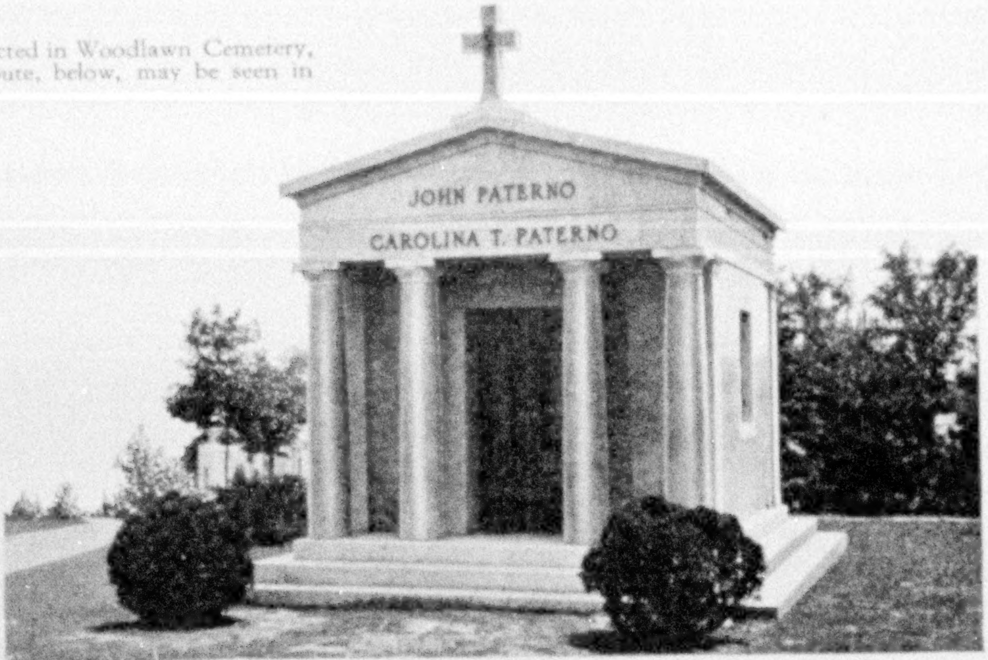
Address.......................................

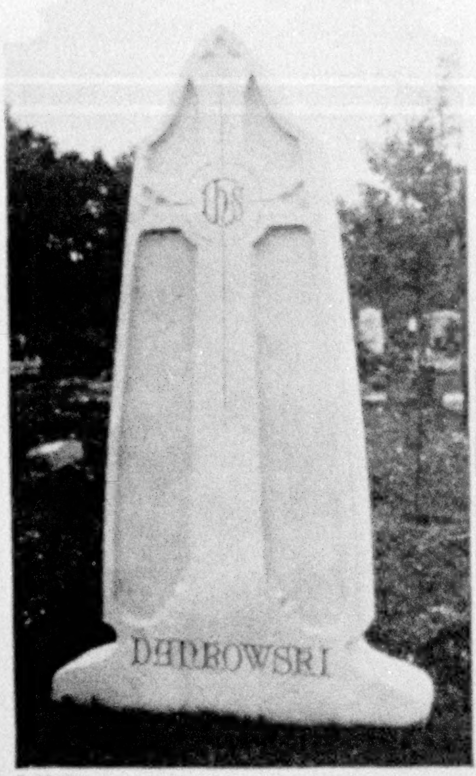
City...

Other Offices: The Pepsodent Co., 191 George St., **Toronto** 2, Ont., Can.; 42 Southwark Bridge Rd., **London,** S. E. 1, Eng.; (Australia) Ltd., 72 Wentworth Ave., **Sydney,** N. S. W.

Only one tube to a family 3256

The Paterno Mausoleum was recently erected in Woodlawn Cemetery, New York City. The Dankowski Tribute, below, may be seen in St. Adelbert's Cemetery, Chicago.





THERE is an everlasting beauty in the subdued, blended colors of Stony Creek Granite, whether polished or in one of the new dull finishes. A Memorial of this material cannot be commonplace. The passing of the years cannot mar it.

The erection of eternal tributes, such as illustrated here, truly represents unmeasured love and devotion. If you are planning a Memorial of distinction, you would appreciate seeing our book, "Modern Memorial Art."

© 1929

Chicago Studios:
BUILDERS' BUILDING
La Salle Street and Wacker Drive

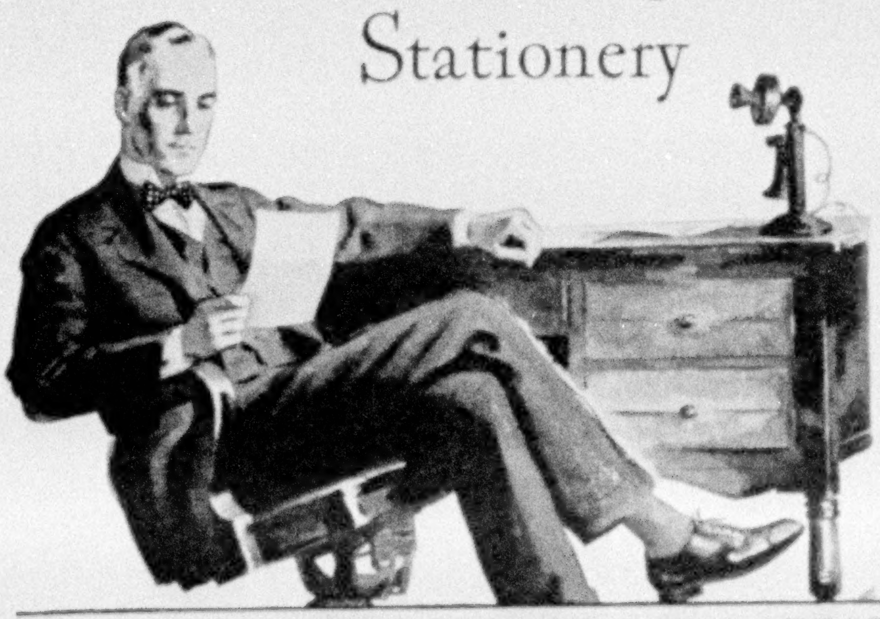
Quarries and Manufacturing Plants:
MILFORD, MASS., KEENE, N. H.
STONY CREEK, CONN.

The DODDS
GRANITE COMPANY
Established 1864
1336 New York Central Bldg., NEW YORK CITY

Exclusive Producers:
MILFORD PINK GRANITE
VICTORIA WHITE GRANITE
STONY CREEK GRANITE

Above Names Protected by Trade Mark

Don't use Letterheads
that contradict your salesmen
use Genuine Engraved
Stationery



LETTERHEADS gossip. They whisper secrets about your business. And sometimes, when they're cheap and flimsy, they give a false impression that may contradict the favorable points your salesmen hoped to make. But genuine engraving tells always a story of stability. In buying, it will pay to look for the identifying symbol pictured here. See that this mark is affixed to the engraving you purchase.

ENGRAVED STATIONERY MANUFACTURERS ENGRAVED REG. U.S. PAT. OFF. ASS'N.

They are Boys and Girls so short a time

See that home movies keep for you their wonderful childhood days

FOR a brief today, they are your carefree children. Before you realize it, they will be men and women—living, perhaps, many miles away. Then, what will you have to bring back their wonderful childhood days?

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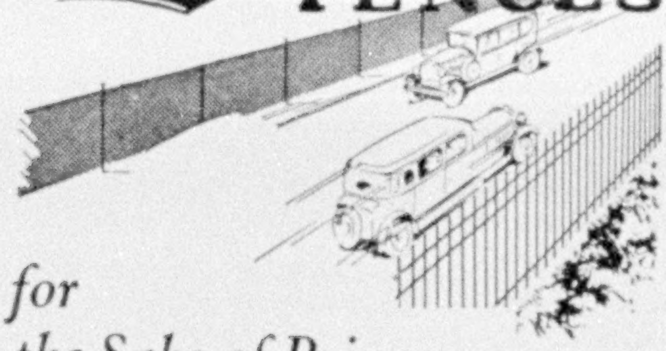

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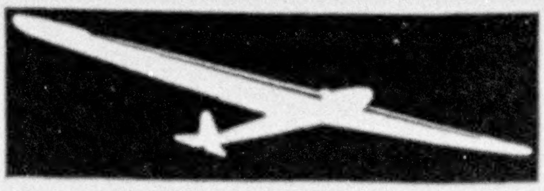

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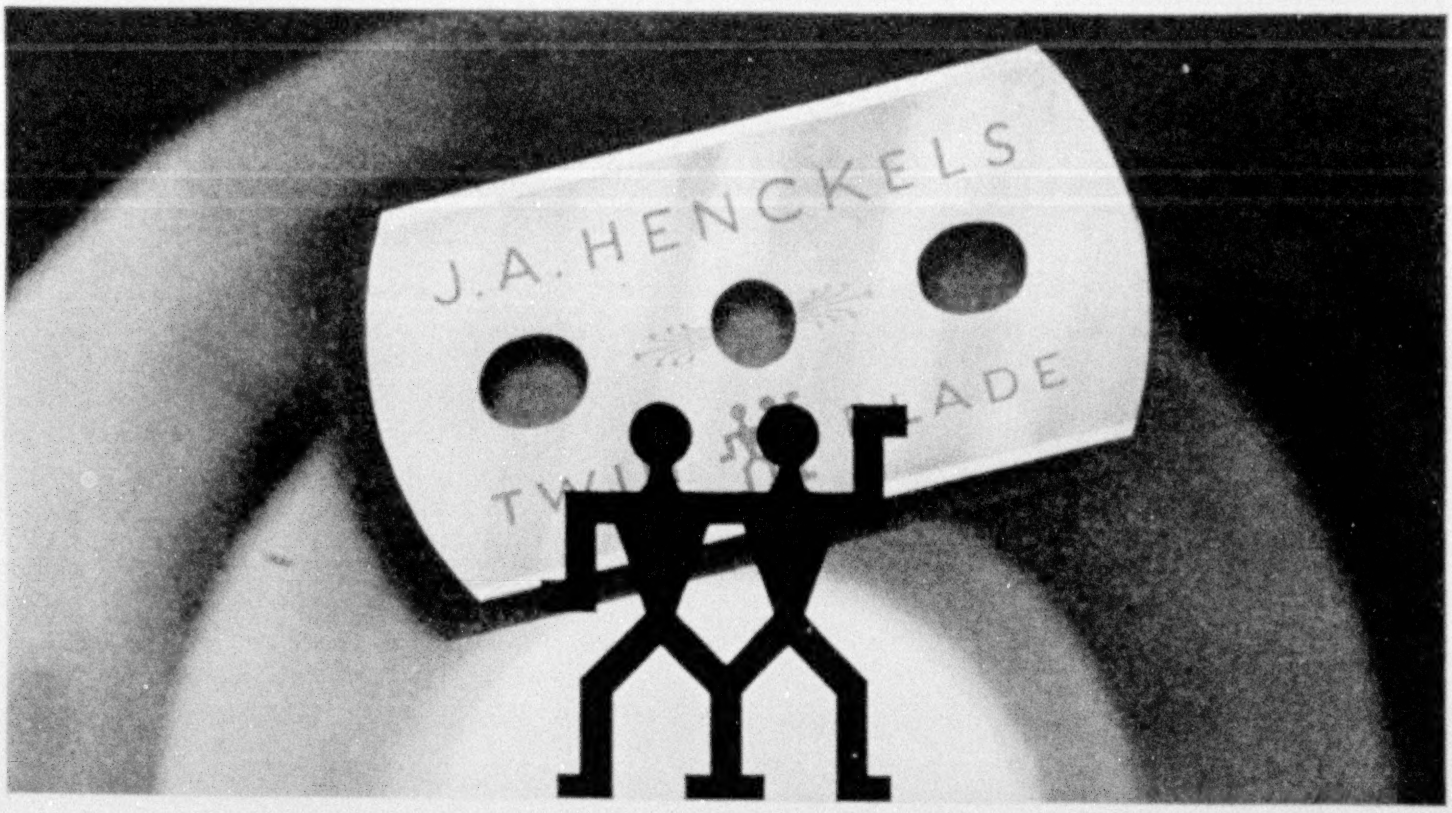

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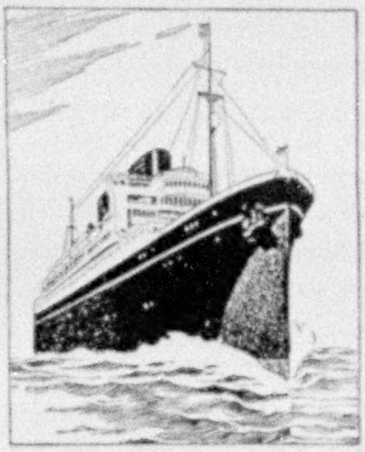

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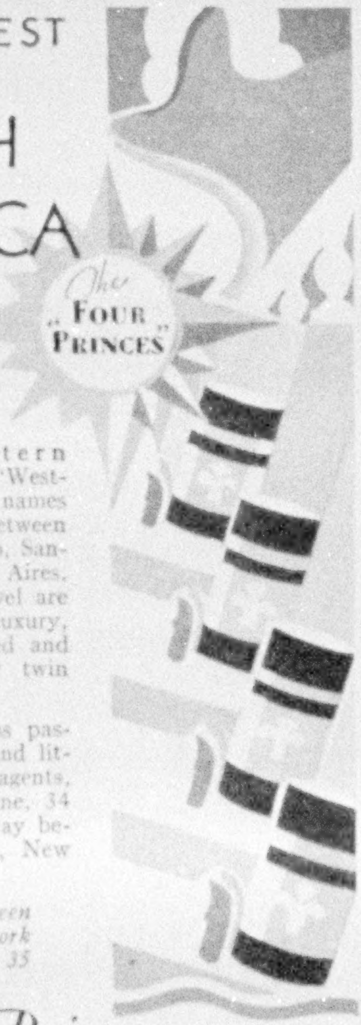

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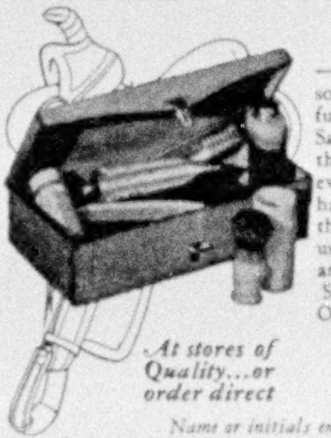

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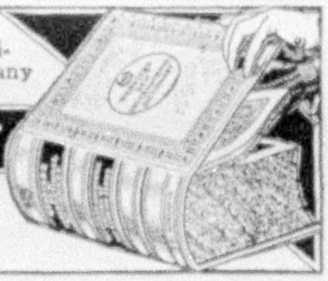

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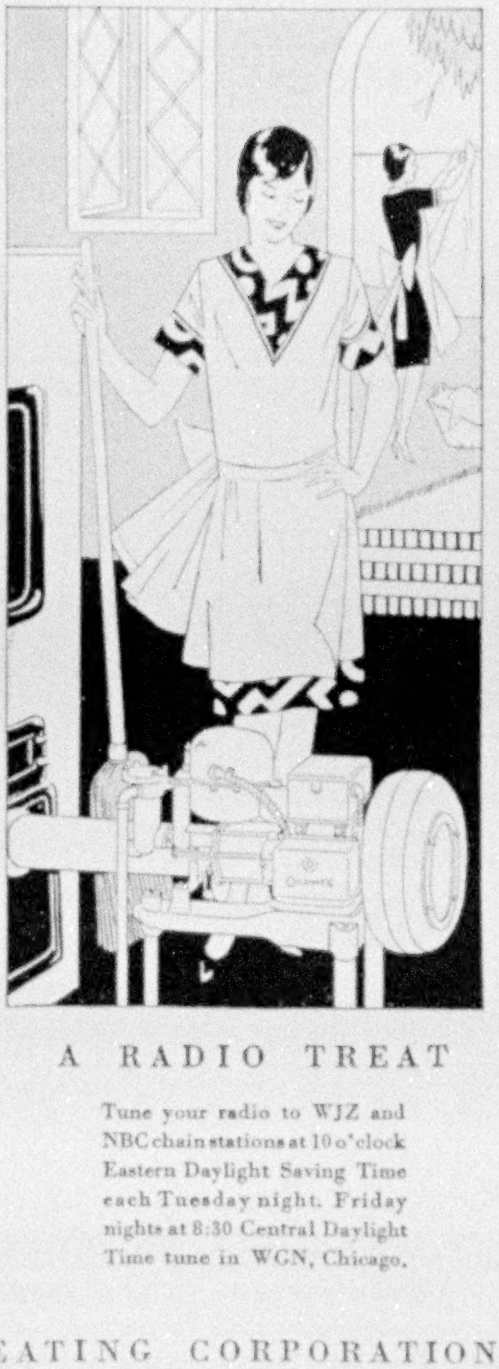

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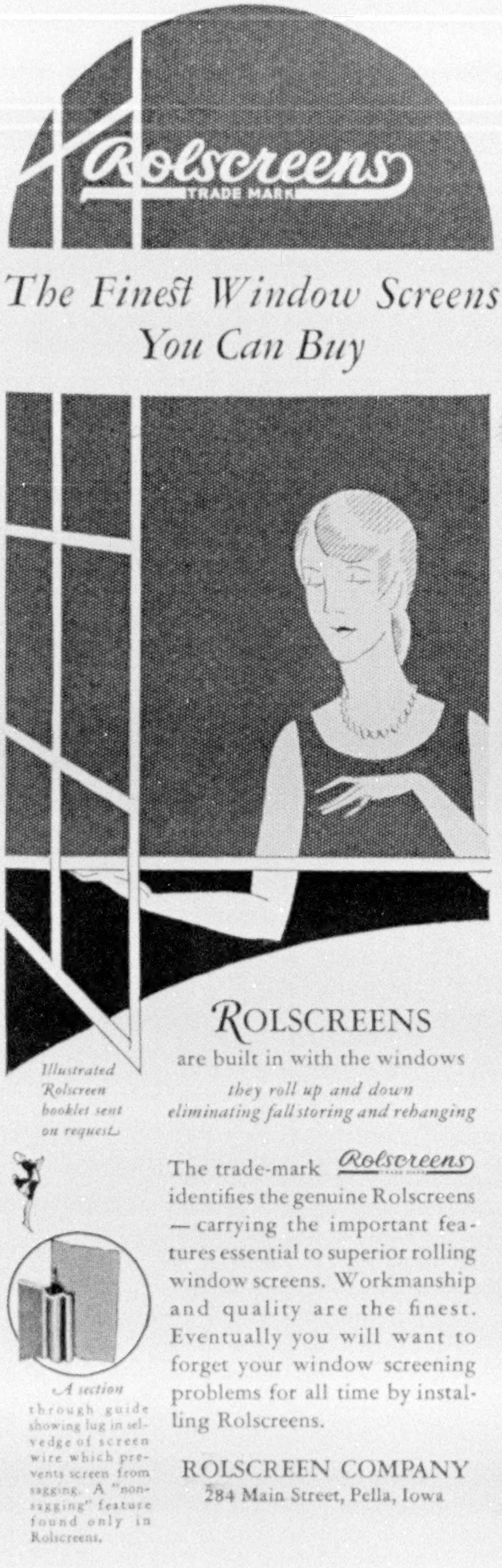

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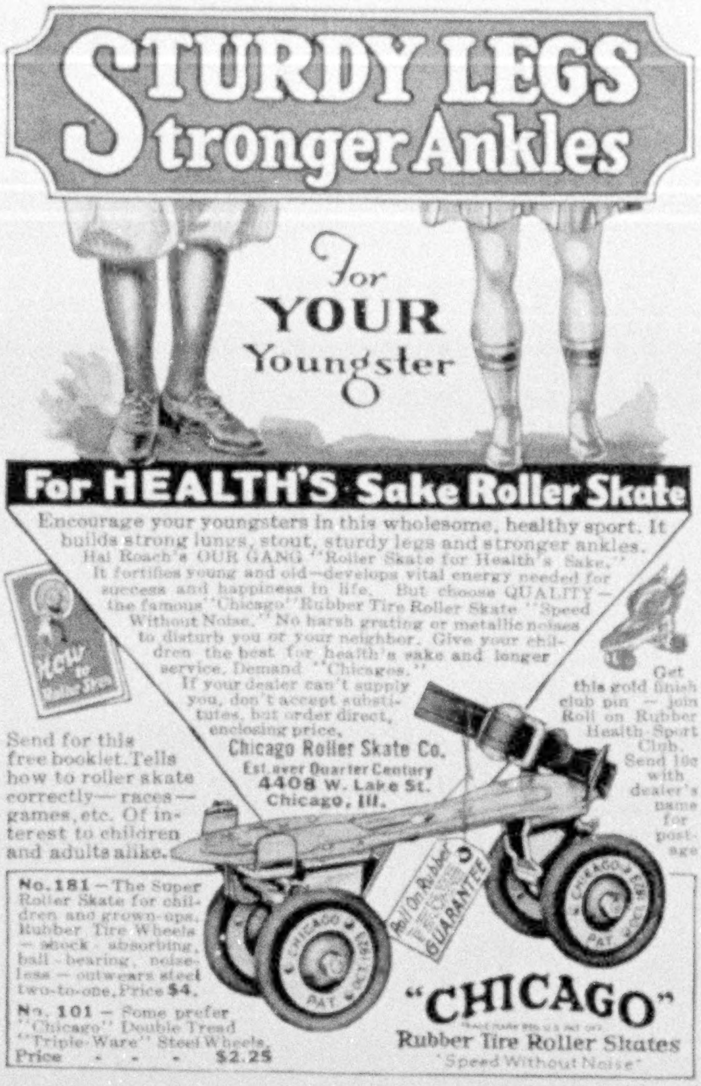

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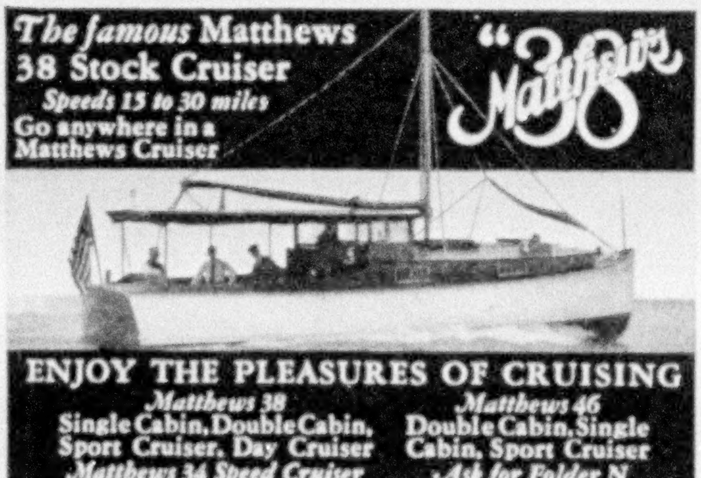

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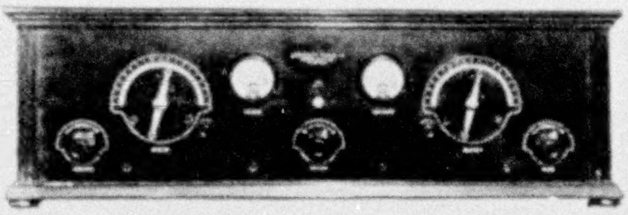

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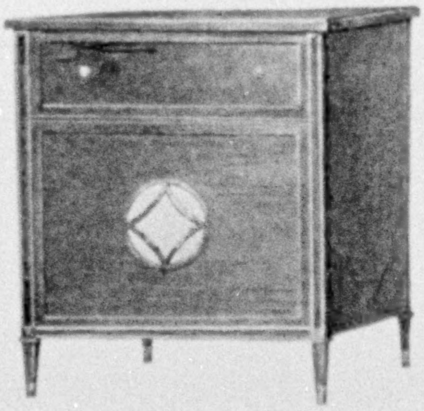

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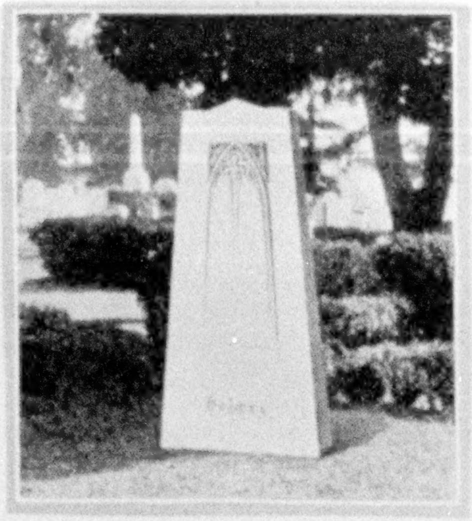

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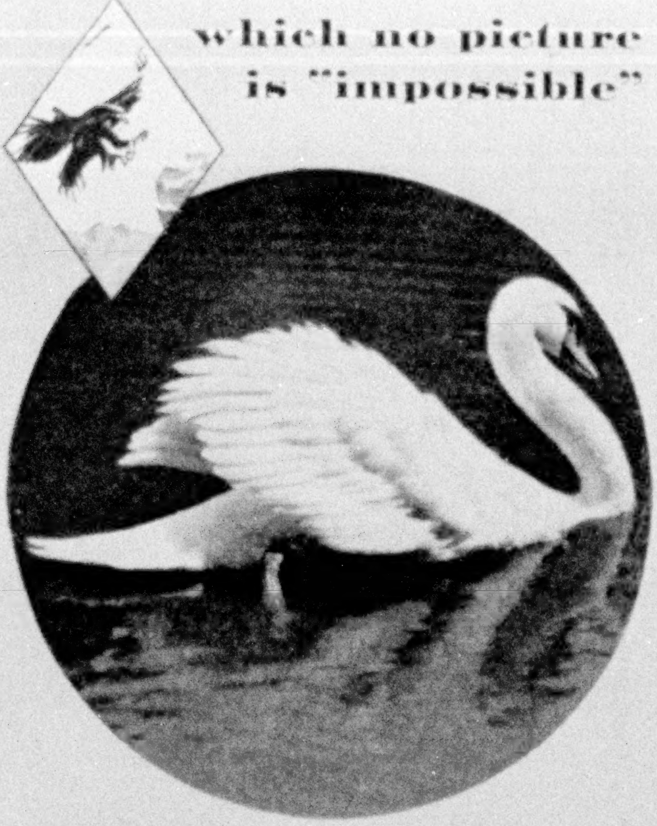


A nature-loving artist captures a picturesque moment from memory, above. But in the actual photograph below! Only a Graflex will do! Perfect focus in spite of swift motion—exquisite art—a picture that thrills for a lifetime!

* * *

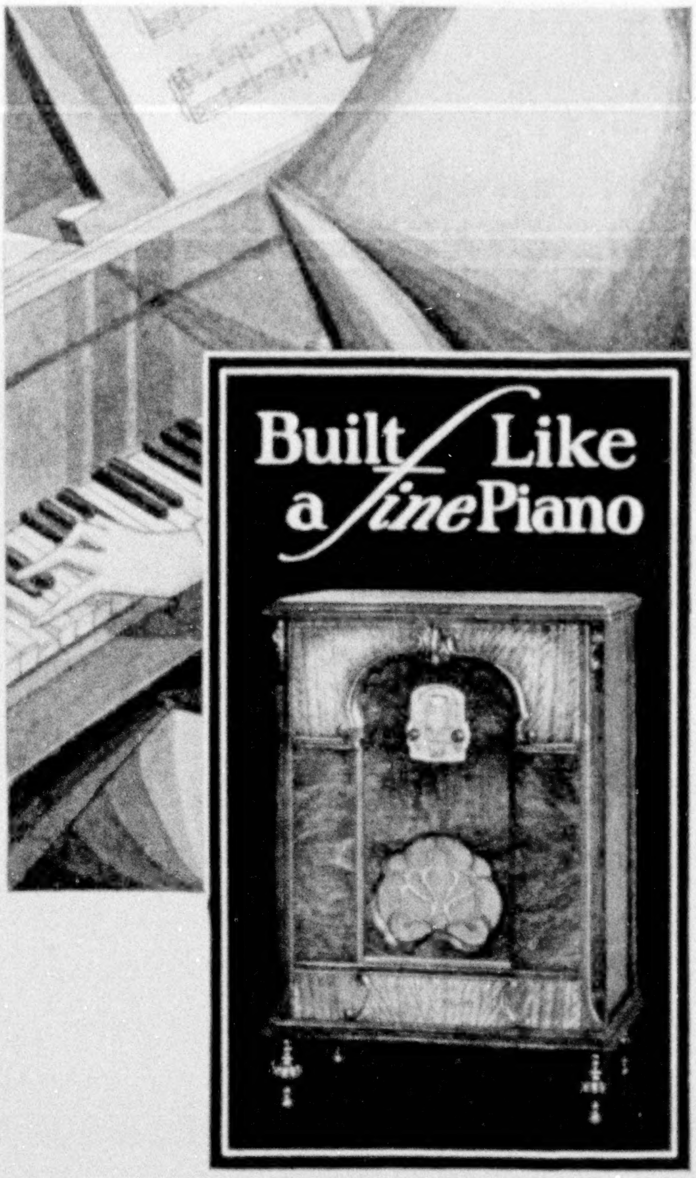
And now there's a simplified Graflex priced within everybody's reach. 3¼" x 4¼"—$80. Other models $85 to $375.

FEATURED BY THE BEST DEALER EVERYWHERE

GRAFLEX

PERFECTLY SIMPLE · SIMPLY PERFECT

FOLMER GRAFLEX CORP. ROCHESTER, NEW YORK


Built Like a fine Piano

Bush & Lane RADIO Built Like a fine Piano

BUILT SIDE by side with concert grands, the new Bush & Lane Radio Models reveal the deep, rich grandeur of a fine piano—an artistry of design and lustrous depth of finish that make ownership a perpetual source of pride and satisfaction.

Thoroughbred in outward character, Bush & Lane Radios are equally distinguished in inward calibre. Indeed, the dial will be your gateway to a new-found pleasure in radio performance.

Several models—all new—await your inspection. You can buy with confidence from the specially appointed dealer, identified by the Bush & Lane Shield.

BUSH & LANE PIANO COMPANY
HOLLAND, MICHIGAN

Write for illustrated brochure, complete with information and prices, showing all the new models of Bush & Lane Radio.

Bush & Lane RADIO

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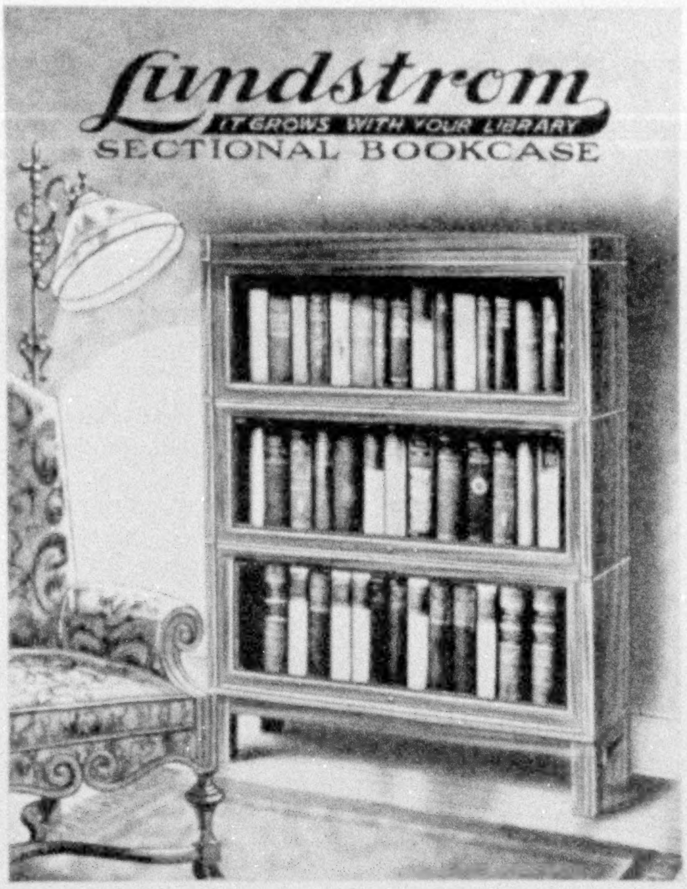
For the Modern Library



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Used in the finest homes and offices throughout the country. Furnished in different designs, materials and finishes. Sold direct from factory only, which insures you a permanent source of supply for additional sections in the future, and also saves you the middleman's profit. Price of three sections with **non-binding, disappearing, felt-cushioned** glass doors, Universal Design (as illustrated), in plain oak, **$15.75;** quartered oak, **$18.25;** imitation mahogany or imitation walnut, **$18.25;** genuine mahogany or walnut, **$23.50.** Other styles and finishes at correspondingly low prices. **Shipped on approval direct from factory** at Little Falls, N. Y., or warehouse at Kansas City, Mo. Write for new catalog No. 80.

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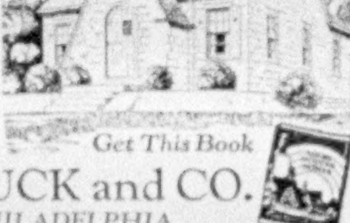
Brick, Stucco, or Frame



WITH architecture, engineering and materials furnished and guaranteed by a national $105,000,000 corporation. FINANCIAL ASSISTANCE, IF DESIRED *Complete Building organization relieves you of all details and insures quality.* Materials for this 6-room home *"The Claremont"* $1456

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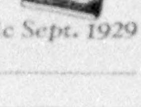

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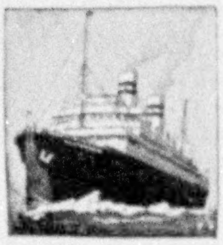

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The Rotterdam is being entirely reconditioned for this coming cruise and you will be pleasantly surprised with the many new improvements and innovations which will make the ever-popular Rotterdam of even greater appeal to the discriminating cruise passenger.

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After twenty-five years devoted exclusively to the manufacture of scientific hearing-aids, the Dictograph Products Co., Inc., Dept. 909-P, 220 West 42nd Street, New York, N. Y., has just perfected a new model Acousticon that represents the greatest advance yet made in the re-creation of hearing for the deaf. This latest Acousticon is featured by a tiny earpiece no bigger than a dime. Through this device, sounds are clearly and distinctly transmitted to subnormal ears with wonderful benefit to hearing and health alike. The makers offer an absolutely free trial for 10 days to any person who may be interested, and a letter will bring one of these remarkable aids to your home for a thorough and convincing test. Send them your name and address today! Advt.

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Diversified, completely arranged shore trips under direction of ship's officer

GRACE LINE 10 HANOVER SQ. NEW YORK

The Line with the Complete Tour Service

A *land where thousands* CHOOSE *to live*.. see why...... this winter

Each year California's citizenry is being increased by thousands who first come to visit and then return to live. This state, more than any other, is one in which people live because they love it. The even, equable climate with the atmosphere of Springtime at every season makes it a land of out-of-doors.

The sports you enjoy in summer are played here in Winter, too. Golf on spectacular courses, set beside the sea or against a mountain background. Riding, boating, hiking, tennis almost every day in the year. These are the reasons why Californians are so successfully winning high places in the field of national and international sport.

Climate, though, is but part of the allure. Here is gay and colorful San Francisco—her Chinatown, her own Grand Opera Company, smart shops, gay restaurants. Cosmopolitan, with ships from all the world in her great harbor. She serves the rich markets not alone on the Pacific Coast but in the lands bordering the Pacific where 900,000,000 people are awakening to modern wants. Rich beyond telling in the natural resources of this great West. Here is opportunity.

Winter here this year to join the throng of merrymakers. Find renewed vigor in the warming winter suns. And as you thrill to the joys of eternal spring, look about you at the wealth of opportunity for those of vision and ability. Not Utopia, no more a land of easy riches than any other, but a place of joyous living where those who are winning success in other sections may find an even finer future here.

More of California's story has been published in a new booklet, "San Francisco". You may have a copy on request. Merely send the coupon.

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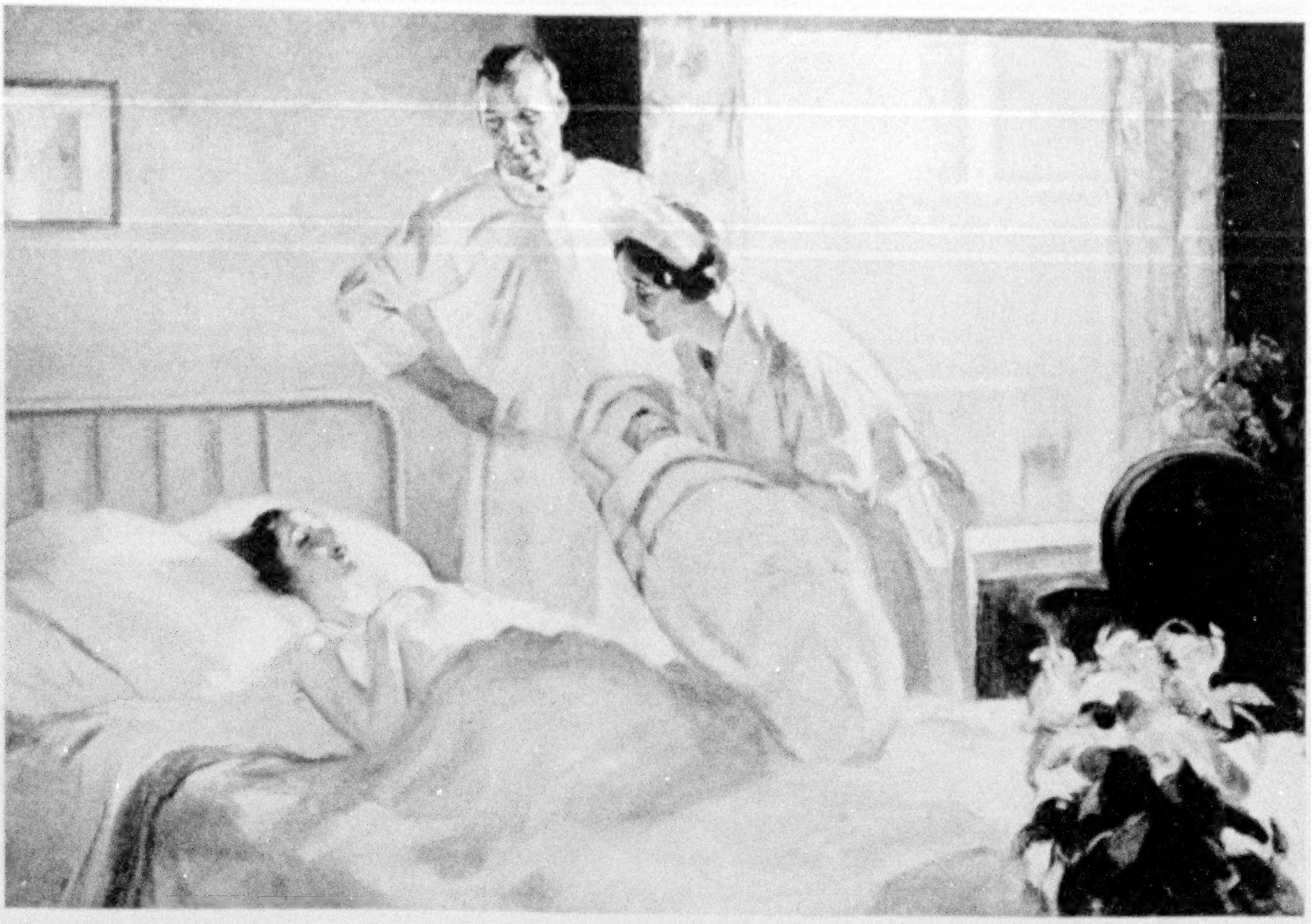


"Is my baby perfect?"

When the first flickering rays of returning consciousness break softly through her mind . . .

When she faces, in one tense moment, the culmination of all those months of alternate distress and delightful anticipation — of constant sacrifice and strange nervous fear . . .

Out of the loving depths of self-forgetfulness springs that thought, eloquent of her warm love for the bright little life beside her:

"Is my baby perfect?"

Fortunately for the mothers of today, the physician and the medical research worker can come nearer than ever before to giving her a happy answer.

Prenatal care, scientific equipment, surgical asepsis, pain-conquering anesthesia, obstetrical skill — all these, developed in less than a century, combine to dispel much of the danger that childbirth so often meant not only to the child, but to the mother as well.

And those diseases that were once regarded as the inevitable visitations of Providence upon children, are, one by one, being conquered by preventive medicine.

No child, for example, need have smallpox today. Diphtheria, too, has been brought well under control. And encouraging strides have been made in the prevention and cure of scarlet fever.

An inspiring goal

In a score of laboratories throughout the world, devoted men and women are seeking effective means of controlling meningitis and infantile paralysis, and of curing those dread diseases, tuberculosis and pneumonia.

Parke, Davis & Company know of no greater responsibility, no greater opportunity to serve humanity, than is offered by the privilege of sharing in such momentous research.

The development of new medicines is as much a part of the daily task of Parke, Davis & Company, as the preparation of the serums and vaccines which already have done so much to guard the children of the world against disease.

PARKE, DAVIS & CO.

The world's largest makers of pharmaceutical and biological products

Your house cannot take

WINGS!

Perhaps you have wondered, knowing that The Hoover is always for sale in the leading stores in your town, why the representatives of those stores like to bring The Hoover all the way to your house to show it to you.

This is the reason: the only way you can really tell what The Hoover will do for you is to try it in your own home.

But your house cannot take wings and come to the store. So The Hoover man comes to your home.

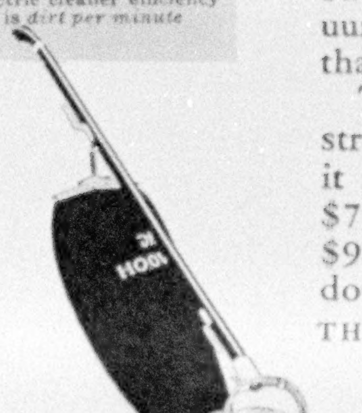
He shows you how much dirt you can get out of a rug with vacuum cleaning alone. Then he shows you how, by adding "Positive Agitation"—the Hoover beating principle—you can get out, not only the surface dust ordinarily removed, but the embedded grit deep in the rug that ordinary cleaning fails to disturb.

When you see the astounding amount of dirt that he can take out of your "clean" rug, you understand immediately why The Hoover, with beating and sweeping added to the suction of the ordinary vacuum cleaner, is able to remove more *dirt per minute* than other cleaners.

Telephone your Hoover dealer for a home demonstration of The Hoover. If you wish ask him to leave it for several days on trial. Model 700 Hoover, $79.50; Model 543, $63.50. With dusting tools, $92 and $76. Floor polisher, $7.50. Only $6.25 down. Liberal allowance for your old cleaner.

more
d.p.m.
—DIRT PER MINUTE

The accurate measure of electric cleaner efficiency is *dirt per minute*



THE HOOVER COMPANY, NORTH CANTON, OHIO
The oldest and largest maker of electric cleaners

The HOOVER
(Reg. Trade Mark)
IT BEATS ... AS IT SWEEPS ... AS IT CLEANS
ON A CUSHION OF AIR

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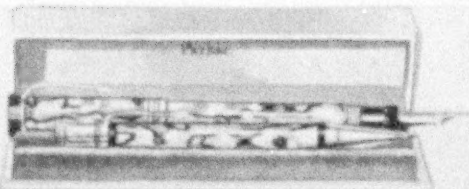
Pencils to match, $3 to $5



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Parker Pressureless Touch—presented in Duofold Pens—asks no one to strain his muscles and exert his mind to do its job of writing. The ink connects with your paper a split-second sooner than the point, and its flow keeps pace with the speed of your hand.

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